Telephony.

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IDEAS.

Ideas are what count. I have spent years in working out to my own satisfaction the possibilities of a good idea. And I sometimes have found that the office boy whom I encouraged had thoughts that could be developed into profitable assets.—George Westinghouse.

An Important Decision.

On subsequent pages of this issue will be found the text of a decision handed down by the Wisconsin Railroad Commission compelling physical connection between telephone companies. This action seeks to force the Wisconsin (Bell) Telephone Co. and the La Crosse Telephone Co. to connect their systems and exchange business on a basis contemplating an equal sharing of the expense by the two companies. The commission gives the companies thirty days in which to comply with the order, but it is expected that the case will be appealed to the Wisconsin Supreme court and later, if necessary, to the United States Supreme court. This means delay, of course, but the recognition of the physical connection theory by the Wisconsin commission is most significant. Wisconsin is known as a progressive state whose governmental ideas have traveled far in the last few years.

The La Crosse case has been in controversy for many months. The Bell company had but 1,500 subscribers in La Crosse, while the Independent company had 4,500. A significant feature of the decision is the denial of the Bell claim that its earning power would be reduced by physical connection. This contention is denied by the Wisconsin commission on the ground that "the subscriber of one company desiring toll service over the lines of the other company must pay in addition to the rate charged the patrons of the latter company a reasonable compensation for the additional service."

It will be remembered that when the California commission rendered a similar decision in that state, an appeal was taken by the Bell interests. They probably hope to secure a delay until the national government takes some steps that will clear the entire situation up.

The Small Company and Its Underground Cable.

The smaller telephone companies are interested in the subject of underground cable, but there is at the present time very little of it in actual use. This is due in a great measure to the matter of cost, as it is a difficult matter, indeed, for the manager of the telephone company in the small town, in the face of the costs which are involved, to convince his directors of the benefits which would be derived from placing most wires underground. Many companies have considerable aerial cable installed and from time to time would like to place parts of it underground. Some do and a greater number would do likewise, as the advantages of the underground construction are conceded to be many.

The article published on another page telling of the installment of cable by the Painesville Telephone Co., of Painesville, Ohio, is an extremely interesting one. The method of installation is a radical departure from the practice in this country, but the reasons therefor and the data given by C. M. Grauel, secretary and manager of the Painesville company, will interest many managers of the smaller companies. Mr. Grauel believes his installation will stand the test of time. He will be glad to answer inquiries regarding any points which TELEPHONY's readers may desire to have explained more fully.

A MAN'S TASK.

To be honest, to be kind; to earn a little and to spend less; to make upon the whole a family happier for his presence; to renounce when that shall be necessary and not to embitter; to keep a few friends, but these without capitulation,—above all, on the same grim conditions, to keep friends with himself—here is a task for all that a man has of fortitude and delicacy.—Robert Louis Stevenson.

The Market Value of Optimism

By HERBERT KAUFMAN

He remembers yesterday's sunshine while you frown at today's storms. He knows that the calm will surely follow the turmoil. The stubbing stone in the darkness is a happy discovered spot which he may hereafter avoid. While others blame Nature for putting thorns on roses, he is glad that she thought to put roses on the thorns. He is grateful for the palm tree and well in the desert—realizing how utterly desolate the sands would be without their oases. Amid the wreckage of disaster, he sees timbers to be picked out for the rebuilding. When the wind sweeps down the grain fields, he plans how he can use the straw.

He always manages to find a bright spot in the gloom—a star trying to shine through the clouds. When he is knocked off his feet, he immediately finds them again —squares his shoulders, tightens up his pluck and starts in to straighten up. Instead of discouraging the promise of the future, he discounts his misfortune. He believes in himself, and with that belief, fertilizes his effort until it blossoms with results.

From the beginning of time, the envious, complacent, lazy half-hearted people of the world have resented his fine enthusiasm. Because he is different, they believe that he must be a fool. He is insane; he isn't balanced; he is abnormal; but it's the abnormality of a better brain and a more fluent imagination.

He's a soldier of the foreguard, marching ahead to open the way and make safer the journeys of those who come after him—who move onward with the power of their feet and their meat. He aims higher than he strikes, and thereby hits a fairer mark than if he aspired lower. He sketches with the pencil of imagination, and even if he seldom builds his towers as high as his plans, he leaves the specifications with which another generation can complete the undertaking.

He's the optimist—the man who believes that he can do it. He fails time and time again, but he fails in his work, not in himself. Even if he went but half-way down the path of progress, he left only half as much still to be done by the man who followed.

All that you have, all that you cherish all that is big and fine and worth while, all your ethics, all your philosophies, all your sanities, all that means most to you, all that has brought you down form the tree homes of your ape forebears, was believed in by one set of optimists and achieved by another.

Nothing that is hard, nothing that bends men's backs and strains their sinews and tears their souls and starves them, would ever be brought to pass if an optimist didn't have that within him which made him feel it was worth while to endure and to suffer for the sake of getting to the place and the thing he wanted.

Ability doesn't count; knowledge is useless; experience has no worth without the driving force of optimism. It's the steam that makes all the wheels go round. It's the sparking plug of the motor—it starts things.

Some one must think for those who won't and can't think for themselves. An optimist had to see the steam of a locomotive through the mist of a tea-kettle before the Baldwins could build their shops. He didn't anticipate the space condenser that whirls you from New York to Chicago over night, but he found the principle—he believed that it could be done.

An optimist found America; an optimist built the airship. An optimist rolled in the gutters of poverty, but even in the gauntest hours he clung to his belief, until he set together the fingers of steel and brass that set these lines into print. He was jeered at and sneered at; nine men out of ten thought him crazy; and ninety-nine in a hundred called him a bore. But he knew all the time, and so it didn't hurt. It takes more than a snicker or a jibe to kill the impulse of creation, which is given to strong men only because Providence doesn't waste her real bounties upon yellow-veined weaklings.

Anything is possible to the man who believes that nothing is impossible. He doesn't always make good, but he makes good oftener than the pessimist. His judgment isn't always right, but many a time the very vehemence of his confidence has carried through an undertaking which half-heartedness would have wrecked.

He can never see failure, because the golden sun of ambition is always shining in his face, blinding his eyes to the impossibilities. He doesn't heed the warnings of discouragement, because higher and clearer than the little noises of the little people, he hears the call of success. He must be what he is. He's filled with the mightiest message given to man! He has been touched with the God-spark that blazes into achievement!

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Wisconsin Commission Orders Connections at La Crosse

Allows Thirty Days to Complete Physical Union of Independent and Bell Systems, Cost to be Divided Equally—Commission Holds That Public Convenience and Necessity Demand Interchange of Service—Ruling Will Probably be Contested by Bell

The La Crosse Telephone Co. and the Wisconsin Telephone Co. have been ordered by the Wisconsin Railroad Commission to make a physical connection between their systems. The expense of making the connection and the subsequent maintenance is apportioned equally upon the companies.

The decision promises to be an epochal one. It is one of the first cases of its kind to be brought to a conclusion before the commission since the passage of the physical connection law two years ago. It is claimed by telephone men that the matter will be appealed by the Bell company to the supreme court and, if beaten there, to the United States Supreme Court. The commission gives the companies 30 days in which to comply with the order.

From the beginning, the case was hotly contested. The judgment and findings of the commission are that public convenience and necessity require a connection between the two companies; that such connection will not result in irreparable injury to the owner or other users of the facilities and that there will be no detriment to the present service furnished.

Judged from a legal standpoint, it is claimed that the decision rendered today dodges the legal snares that have encountered similar orders made by other commissions in other states. The ruling says:

"Notwithstanding the contention of the respondents that the statute transgresses certain constitutional guarantees of property rights, it was manifestly framed with great care, and with a view of protecting the utilities in the enjoyment of all of their rights and privileges, while at the same time compelling an involuntary enlargement of the use of their facilities when necessary and required for the public welfare. There is nothing in the letter or spirit of the law that savors confiscation, and, if administered according to its obvious intent and purpose, no property rights will be impaired and no injury inflicted upon anyone.

"That great difficulty will be encountered, in certain instances, in prescribing such terms and conditions upon which the connection shall be made, as will safeguard the rights and interests of all concerned, is evident to everyone conversant with the complexity of the situation presented by the numerous competing and conflicting telephone utilities now engaged in serving the public with their facilities and disturbing its tranquility with their strifes. But mere inconvenience in the application of the terms of a statute to the facts of some intricate case that may arise, is not a ground for invalidating the statute. Some constitutional limitation or restriction must be violated by the provisions of a statute before legislation can be set at naught. The act here under consideration is, in our judgment, free from the imputation of such infirmity."

The ruling then goes into a history of telephone service in the city of La Crosse. It points out that the number of subscribers of the Bell company is approximately 1,500 and that of the local company approximately 4,500, the annual revenues of the former from toll service amounts to about $6,000 and of the latter to about $4,500. The commission then says:

"Without reviewing the evidence at length adducted upon the hearing upon this phase of the case, suffice it to say that in the light of all of the facts and circumstances disclosed in the investigation, the conclusion in our judgment is inevitable that public convenience and necessity require that a physical connection of the respondents' systems or lines to be so made that the subscribers of each exchange may through the telephone installed by them in their residences or places of business, communicate over the toll lines of both exchanges."

The commission goes on to argue that the earning power of the Bell company will not be disturbed by the making of the connection, because "the subscriber of one company desiring toll service over the lines of the other company must pay in addition to the rate charged the patrons of the latter company a reasonable compensation for the additional service." The full text of this ruling follows. The case is that of Frank Winter vs. the La Crosse Telephone Co. and the Wisconsin Telephone Co.

The Petitioner's Claims.

The petitioner is a resident of the city of La Crosse and alleges that in the city of La Crosse, two telephone systems are in operation, one known as the Bell system, belonging to the Wisconsin Telephone Co., and the other operated by the La Crosse Telephone Co., which company is owned and controlled by local capital; that he is a user of three telephones of the La Crosse Telephone Co., but is not a subscriber of the Wisconsin Telephone Co.; that as such subscriber of the La Crosse company, he finds it to his interest to use almost daily the toll lines of the Wisconsin Telephone Co.; that the Wisconsin Telephone Co.'s toll lines extend into many towns and villages and to telephone systems not reached by the La Crosse Telephone Co., and between which no direct communication may be had; that public convenience and necessity require a physical connection between the toll lines of each of the said companies and the exchange system of the other; that such connection would greatly extend the use of telephones of each, and be of great advantage to subscribers of both systems. Wherefore the petitioner in behalf of himself and other citizens of La Crosse asks that an investigation be made of the matter, and an order be made directing physical connection of each of said systems with the tolls lines of the other, determining and prescribing the conditions and compensation for such joint use, and by whom the expense of making and maintaining such connection shall be borne.

The respondent, the Wisconsin Telephone Co., answering the petition, admits all the formal allegations thereof, but denies that public convenience or necessity requires a physical connection of the toll lines and the telephone system of the Wisconsin Telephone Co. with the toll lines and telephone system of the La Crosse Telephone Co. or that the Railroad Commission of Wisconsin has jurisdiction, right or authority to take any proceeding upon said petition or make any order with relation to any of the matters referred to or any of the allegations contained therein, but alleges that any order made, directing such physical connection to be made, will deny the Wisconsin Telephone Co. the equal protection of law and of trial by jury, and will be the taking of its property without due process of law and without due compensation; and that such connection will result in substantial detriment to service furnished by both or either of said companies; wherefore the respondent, the Wisconsin Telephone Co., prays that the petition be dismissed.

The hearing was held January 3, 1912, at the Capitol, in the city of Madison. Frank Winter appeared in his own behalf; L. G. Richardson and Hunt Shipley, attorneys, and Edwin S. Mack, of counsel, appeared for the Wisconsin Telephone Co.

It appears that there are two telephone companies operating in the city of La Crosse; the Wisconsin Telephone Co., commonly called the Bell company and the La Crosse Telephone Co., the latter being owned and controlled by local capital. The local system was installed because the subscribers of the Bell system believed they were charged exorbitant rates, and the farmers in the vicinity of La Crosse owning their own lines were not able to secure connections with the Bell lines, and also because of the demand by the Bell company for increased toll when connections outside of La Crosse were given.

The Effect of Competition.

The La Crosse company had the advantage over the Bell system, as local people did not dare to patronize a foreign concern which was in competition with an enterprise controlled by local capital and, although rates of the Bell system were lower than those of the local system, subscribers of the former system changed to the local system after the latter was installed. In consequence, the local system rapidly increased the number of its subscribers with a corresponding decrease in the number of subscribers of the Bell system. The better class of subscribers, as a rule, took the telephones of the local system, and these are the greater users of the toll lines. The effect of the competition may be fully appreciated when we consider that originally the Bell system had 2,500 subscribers, which at the time of the hearing was reduced to 1,650, while the subscribers of the local system numbered 4,000. The toll calls amounted in one month to $6,000 for the Bell system, and to about $4,500 for the local system.

All toll lines extending out of La Crosse and owned or leased by the competing companies, are the Kneen system, Teasdale system and the Gaveney system. The toll lines entirely within the state owned by the Wisconsin Telephone Co. and extending out of La Crosse, are La Crosse-Eau Claire, La Crosse-Black River Falls, La Crosse-Sparta, La Crosse-Tomah, La Crosse-Manston, La Crosse-Viroqua, La Crosse-Madison, La Crosse-Milwaukee, and La Crosse-Coon Valley. Connection is also made by the Wisconsin Telephone Co. with the American Telephone & Telegraph Co.'s lines, the La Crosse-Minneapolis and the LaCrosse-Tomah lines, and with other lines running into Minnesota known as the La Crosse-Minneapolis, La Crosse-Winona, and La Crosse-Houston lines, which belong to the Northwestern Telephone Co. The La Crosse Telephone Co. is connected with local farmers' lines running to Viroqua, Coon Valley, Westby, Sparta, Tomah and Galesville. It also connects with the LaCrosse Interurban Telephone Co. on the southwest, and has one circuit to Sparta, one to Viroqua, and another to Prairie du Chien. It connects with the Tri-State Telephone & Telegraph Co. on the west, and with the Standard company on the southwest.

The chief operator of each of the competing exchanges has installed upon his desk a telephone of the other exchange, which is the only connection between the two exchanges, but neither of these telephones is connected with the switchboard of the subscribing telephone company.

Relative to the physical possibility of making connection between the competing system for toll service, it appears that the new building of the La Crosse Telephone Co. is located about four blocks from the office of the Bell system. A connection could be made at any one of three junction points. The central could be located at Main street, in which street the conduits of both companies are laid parallel to each other. In the conduit of the La Crosse company there is sufficient room to accommodate a 25-pair cable, which is deemed sufficient to handle the business. The increase of business would not require any additional poles or arms, but some additional office equipment would be needed.

When two systems are connected, quicker connections are obtained through the single exchange than through the double exchange, because the first connection is made by the receiving operator, while in the second case it is trunked across to another operator. In cities where two exchanges are operated and connected by trunking from one exchange to the toll board of the other, the second exchange is supervised by the operator taking the call so that it is handled precisely as if it were a connection through one exchange. It was shown that where a connection is desired by an Independent operator for a toll on the Bell lines, where there is physical connection, the trunking throughout can be supervised by the operator of the Independent company. But where there is no such connection, as in the instant case, and a toll message is received over Bell lines for a subscriber of the Independent system, who has not also a Bell telephone, the line is disconnected until the party can be reached by messenger or otherwise, when a connection must again be made with the toll lines. Calls thus delayed are always a greater expense to the company than calls immediately responded to, and for this reason the expense of toll calls, when a physical connection is established, is not as great as in cases where no physical connection exists.

It was also maintained that the efficiency of service might be impaired by the connection because of the use of different apparatus by the two companies. Although the Bell company uses the Western Electric receiver and transmitter, while the La Crosse Telephone Co. uses the Vote-Berger apparatus, it was shown that connections are now being made in different cities between the Bell company and other telephone companies using different receiving and transmitting apparatus without any difficulty, and with apparent satisfactory results. However, some of the employes of the Bell company were of the opinion that the transmission from such a connection was not as clear as that coming from stations using the same apparatus; but the concensus of opinion of telephone engineers is that no material deterioration will result in the service because of such connection.

The greatest trouble in establishing clear connections over two lines, it was found, usually occurred in cases where messages were transmitted over the American Telephone & Telegraph Company's lines, due partly, it is believed, to the use of different transmitting apparatus, but principally to the fact that the batteries at the substations of the connecting lines are not kept up to standard. This difficulty can, however, readily be corrected by order of the commission requiring the batteries to be maintained in efficient operating condition.

One Argument Against Physical Connection.

In support of the contention that a physical connection would result in ruining the exchange business and decreasing the number of its subscribers, with a corresponding increase in the list of subscribers of the La Crosse Telephone Co., it was pointed out in behalf of the Wisconsin Telephone Co. that those using both telephones now, would only need one telephone when such connections were formed, and the local company naturally would be favored.

As it is now, 450 establishments maintain both telephones, and although the long distance calls over the Bell system would be increased, the cost of operation would be correspondingly increased, and the increase would not compensate for the loss of the local subscribers. To meet the objection, it was suggested that a rule be adopted discontinuing the toll service in cases where one now using the Bell system discontinued the use after the connection of the two systems, but it was urged that such a rule would not affect those not making heavy use of the tolls, as they would find it more advantageous to maintain only one telephone. While this objection is vital, it is not insurmountable, as we shall see later.

Benefits of Connection.

It will also be noticed that the La Crosse system maintains more than twice as many telephones as the Bell system maintains. This, it is claimed, would result in great benefit to the Bell system, because by merely connecting the trunk lines of the two systems all the subscribers of the local company would have toll access to the Bell line. The better class of patrons, those using the toll lines to a greater extent, have the La Crosse instruments in their homes, and as 25 per cent. of the toll business is done in the evening after people have reached their homes, it is said that a large amount of toll business would originate on the La Crosse system at a time when the Bell toll lines are least employed.

It must be conceded that the public of La Crosse would be greatly benefited by a physical connection between the switchboard of the La Crosse company and the toll lines of the Bell system. It would result in a great saving of time to subscribers having only the La Crosse company's telephones, which are the greater number. Only 8 per cent. of the total telephone subscribers in La Crosse have both telephones. Twelve or fifteen large business houses have an interior system connected with the trunks of both systems.

The cost of outgoing messages varies with circumstances, depending upon salaries of the operators and local conditions. The cost of one call is determined by taking the total receipts of in and out toll business, together with the expense of giving the service, and the number of calls received and sent. By this method of reckoning, the cost of an outward message from La Crosse to Sparta is found to be 4 cents. The expense of an outward call is somewhat greater than an inward call.

Four toll operators are employed at present by the Bell company at La Crosse, but with additional connections resulting through a physical connection, additional operators would be required. At the present time only one is retained after ten p. m.

The foregoing resume of the testimony, which is quite voluminous, contains all the salient facts brought out upon the hearing, and necessary to a decision of the controversy between the parties. In the light of such facts we must determine whether involuntary action in the matter at issue may be required of the respondent telephone companies.

The statute provides that (Sec. 1707m-4):

"..... every utility for the conveyance of telephone messages shall permit a physical connection or connections to be made, and telephone service to be furnished, between any telephone system operated by it, and the telephone toll lines operated by another such public utility, or between its toll line and the telephone system of another such public utility, or between its toll line and the toll line of another such public utility, or between its telephone system and the telephone system of another such public utility, whenever public convenience and necessity require such physical connection or connections, and such physical connection or connections will not result in irreparable injury to the owners or other users of the facilities of such public utilities, nor in any substantial detriment to the service to be rendered by such public utilities. The term 'physical connection,' as used in this section, shall mean such number of trunk lines or complete wire circuits and connections as may be required to furnish reasonably adequate telephone service between such public utilities.

"In case of failure to agree upon such use or the conditions or compensation for such use, or in case of failure to agree upon such physical connection or connections, or the terms and conditions upon which the same shall be made, any public utility or any person, association or corporation interested may apply to the commission, and if after investigation the commission shall ascertain that public convenience and necessity require such use or such physical connection or connections, and that . . . such use or such physical connection or connections would not result in irreparable injury to the owner or other users of such equipment or of the facilities of such public utilities, nor in any substantial detriment to the service to be rendered by such owner or such public utilities or other users of such equipment or facilities, it shall by order direct that such use be permitted and prescribe reasonable conditions and compensation for such joint use, and that such physical connection or connections be made, and determine how and within what time such connection or connections shall be made, and by whom the expense of making and maintaining such connection or connections shall be paid.

Such use so ordered shall be permitted and such physical connection or connections so ordered shall be made, and such conditions and compensation so prescribed for such use and such terms and conditions, upon which such physical connection or connections shall be made, so determined, shall be the lawful conditions and compensation for such use, and the lawful terms and conditions upon which such physical connection or connections shall be made, to be observed, followed and paid, subject to recourse to the courts upon the complaint of any interested party, as provided in sections 1797m-64 to 1797m-73, inclusive, and such section as far as applicable shall apply to any section arising on such complaint so made. Any such order of the commission may be from time to time revised by the commission upon application of any interested party or upon its own motion."

It will be observed that before the duty of making a physical connection of telephone lines under the statute is imposed upon telephone utilities, and can be enforced in any case, it must appear:

1. That the connection is required by public convenience and necessity;
2. That it will not result in irreparable injury to the owner or other users of the facilities of such public utilities; and
3. That no substantial detriment to the service will result therefrom.

Unless these conditions exist simultaneously, the utilities are free to make or to refuse to make connection of their lines, as their action in the matter in such event lies entirely within their discretion. Notwithstanding the contention of respondents that the statute transgresses certain constitutional guaranties of property rights, it was manifestly framed with great care, and with a view of protecting the utilities in the enjoyment of all their legal rights and privileges, while at the same time compelling an involuntary enlargement of the use of their facilities when necessary and required for the public welfare.

Law Does Not Savor of Confiscation.

There is nothing in the letter or in the spirit of the law that savors of confiscation, and if administered according to its obvious intent and purpose, no property rights will be impaired and no injury inflicted upon anyone. That great difficulty will be encountered, in certain instances, in prescribing such terms and conditions upon which the

connection shall be made, as will safeguard the rights and interests of all concerned, is evident to every one conversant with the complexity of the situation presented by the numerous competing and conflicting telephone utilities now engaged in serving the public with their facilities and disturbing its tranquility with their strifes. But mere inconvenience in the application of the terms of a statute to the facts of some intricate case that may arise, is not a ground for invalidating the statute. Some constitutional limitation or restriction must be violated by the provisions of a statute before legislation can be set at naught. The act here under consideration is, in our judgment, free from the imputation of any such infirmity.

Merits of Case.

Passing to the merits of the case, we are first met with the issue whether public convenience and necessity require a physical connection of respondents' lines or systems for the purpose of toll service. The question of such connection for the purpose of rendering local service of a character that would give the subscribers of one exchange telephone connection with the subscribers of the other exchange within the city of La Crosse was eliminated from the case by stipulation of the parties.

The term "public convenience and necessity" is indeterminate. It is usually found in statutes requiring some act to be performed or creating some new public obligation not imposed by the common law, which interferes with private rights. As a justification for such interference there must be a public exigency demanding it, which is always a question of fact depending upon a variety of considerations.

In the case before us, it appears that the city of La Crosse has a population of 30,000. Within the city are two competing local telephone exchanges. Each has toll connections with other lines and systems. The subscribers of one exchange often require the toll service of the other exchange. This can now be had only by a subscriber installing telephones of both exchanges, or, when needing the toll service of the exchange to which he is not a subscriber, going to some public station of such exchange. The loss of time and inconvenience thus occasioned is often embarrassing as well as expensive.

As the Bell system is connected with lines and systems covering the entire country, the demand for the service of the Bell toll lines by the subscribers of the local company is naturally greater than the demand for the services of the toll lines of the local company by the subscribers of the Bell company. This is reflected in the toll revenues of the companies, respectively. While the number of subscribers of the Bell company is approximately 1,500, and that of the local company approximately 4,500, the annual toll revenues of the former amounts to about $6,000, and of the latter to about $4.500. Without reviewing at length the evidence adduced upon the hearing upon this phase of the case, suffice it to say that in the light of all the facts and circumstances disclosed in the investigation, the conclusion in our judgment is inevitable that public convenience and necessity require that a physical connection of the respondents' systems or lines be so made that the subscribers of each exchange may through the telephones installed by them in their residences or places of business, communicate with persons over the toll lines of both exchanges.

In this connection it may be well to consider the apprehension of the Bell company that its local exchange would be deprived of its patronage if its toll line facilities were made available to the partons of the competing exchange. It is evident that the only inducement to subscribe to the Bell system is the fact that thereby the subscriber is connected with a root telephone system covering like network the entire country. The contention of petitioner that no consideration should be given to this fact, but that the toll lines should be treated separately and not as an adjunct of the local exchange, does not seem tenable when we estimate the consequences to property rights that are likely to flow from such course. For the purpose of accounting and ascertaining equitable rates to be charged the public for services, it is essential to make such separation and to treat each exchange and class of service as a separate utility, although a common ownership of the property devoted to the different classes of service exists. But separating the property for the purpose of devoting one part to a use which will result in injury or damage to the use of the other part is entirely another matter, and cannot be done without compensating the owner for the damage thus sustained. No subterfuge can be indulged under the statute which will have the effect of depriving any private property employed in a public service, of its earning capacity.

In the peculiar situation found in the instant case, it is possible to prescribe terms and conditions which will preserve the interests of the utilities respectively after the connection has been made. The subscriber of one company desiring toll service over the lines of the other company must pay in addition to the rate charged the patrons of the latter company a reasonable compensation for the additional service. Neither company will be permitted to absorb such additional charge, but the same must be paid by the patrons of either company using the toll lines of the connecting company. This will not result in any discrimination between subscribers of the same exchange, but will result in a just and necessary discrimination between the subscribers of the two exchanges. A subscriber, who has not installed the telephones of both exchanges, is not entitled to the toll service of both exchanges without paying an adidtional charge to the exchange with which he is not connected when desiring to use its toll line facilities.

There is no evidence showing that any irreparable injury will or can result to the owner or other user of the facilities of the respondent companies. Under the terms and conditions outlined above, the business of neither company will be disturbed, and their relations to each other with respect to existing local business will be the same as at present. Certainly neither can suffer any injury under the circumstances.

It is practically conceded that no material detriment will result to the service of either company should the connection sought in this case be made.

The Commission's Order.

For the reasons assigned it is the judgment and finding of the commission:

1. That public convenience and necessity require a physical connection of respondents' telephone lines or systems in the city of La Crosse for the purpose of enabling the subscribers of each exchange to avail themselves of the toll line facilities of the other exchange from the telephone stations installed in their residences or places of business;

2. That such connection will not result in irreparable injury to the owner or other users of the facilities of such public utilities; and

3. That such connection will not result in any substantial detriment to the service to be rendered by such public utilities.

The cost of making the connections and thereafter maintaining them will be small, and under the circumstances will be apportioned equally between the companies.

Now Therefore, It is ordered that the La Crosse Tele-

phone Co. and the Wisconsin Telephone Co. make such a physical connection or connections between their toll lines or systems as is required for the furnishing of toll line service to the subscribers of each company, at the stations installed in their residences and places of business, over the toll lines of the other company.

It Is Further Ordered, That the expense of making such physical connection or connections and the subsequent maintenance thereof be and the same is apportioned equally between said companies.

Thirty days is deemed a reasonable time within which the companies shall comply with the terms of this order.

Dated this fourteenth day of May, A. D. 1913.

Railroad Commission of Wisconsin.

Pacific Coast Telephone Investigation.

C. J. Smythe, of Omaha, Neb., former attorney-general of Nebraska, has, according to a Washington dispatch, been appointed special assistant to Attorney-General McReynolds to investigate the telephone situation on the Pacific coast, particularly in Washington and Oregon. Charges of violation of the Sherman anti-trust law by the Bell interests were recently placed before the attorney general at Washington, D. C.

The federal grand jury at Seattle, Wash., which early this year began an investigation of telephone mergers on the Pacific coast, adjourned recently without mentioning the telephone cases in its report. The investigation was discontinued when the national administration changed, but it is understood that United States District Attorney Charles F. Riddell received instructions from Washington to preserve the testimony taken for the use of the government.

Ohio Mutual Companies to Report Through Independents.

Representatives of Independent telephone companies appeared before the tax commission at Columbus, Ohio, recently to discuss a plan by which all mutual telephone companies would make their reports through the Independent telephone companies of the business done. By adopting this plan the commission could save much trouble for the smaller companies.

Those representing the telephone companies were Henry P. Folsom, Circleville; Frank L. Beam, Mt. Vernon; H. P. Taber, Marietta, and W. L. Carey, Columbus. It is expected that the plan will be worked out by the members of the tax commission within a few weeks.

Telephone Rates in California.

The California Railroad Commission is engaged in preparing schedules for the fixing of telephone rates for the coming year in California. No material change for this years is expected.

In connection with this rate fixing the president of the commission says that he is convinced that the present system of fixing the rates is unscientific and wrong and that the equitable way would be to base the rates on actual service rendered. A service basis should be applied all the way through from the big concerns that maintain private exchanges down to the most infrequent user of the party lines, with a minimum charge as is provided in other utility services.

He contends that it is entirely unjust to charge a flat rate that is the same on two business telephones, whereas one may be used for five hundred calls during the month while the other has but one hundred calls. He suggests the use of a register that would automatically record each call and the bills would be rendered on the computation of these calls each month.

This plan is held to be reasonable inasmuch as such a system is used in other public services such as the water, light and gas.

Saved St. Louis Subscribers $2,000,000 Annually.

The Kinloch Telephone Co. has saved the people of St. Louis $2,000,000 annually in telephone charges since the organization of the company according to a statement recently made to the Public Service Commission by H. Linton Reber, vice-president and general manager of the company. He based his estimate upon the rates for business and residence telephones charged by the Bell company when the Kinloch company entered the field.

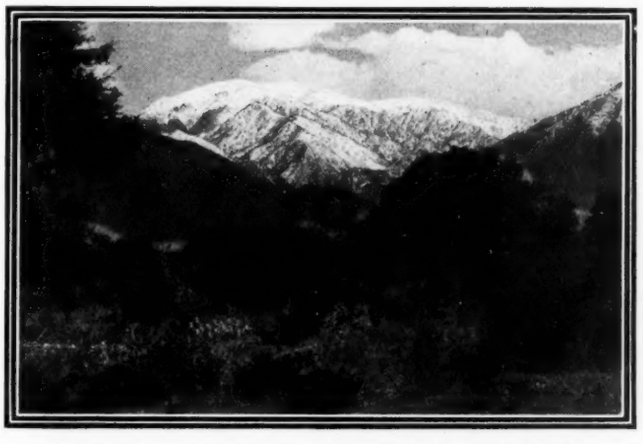
He said that the stockholders of the Kinloch company are not making money, but that the company pays an annual dividend of 5 or 6 per cent. on $2,800,000 capital stock, meets the interest upon a bonded indebtedness of $5,000,000, and has created a depreciation fund of $1,000,000 for replacement.

The rates of the Kinloch are lower, he said, than those of the Bell and Missouri & Kansas Telephone companies. The Missouri & Kansas claims to be losing $400,000 annually, while the Bell yields an annual dividend of about 4 per cent., Mr. Reber thought.

The Commission is gathering information upon the telephone business in Missouri, preliminary to determining whether the rates now being charged are fair to people.

A Telephone on "Old Baldy."

Telephone service is being installed at the summit of "Old Baldy," in California, 11,000 feet above sea level. The government is establishing this service for the use of the warden to report forest fires. W. B. Dewey, a former guide, now has a camp at the summit and he can see from this point the smallest fire, and give instant information to the rangers. This will be the highest telephone station in California.



Old Baldy, Highest Peak in California, to Have Telephone.

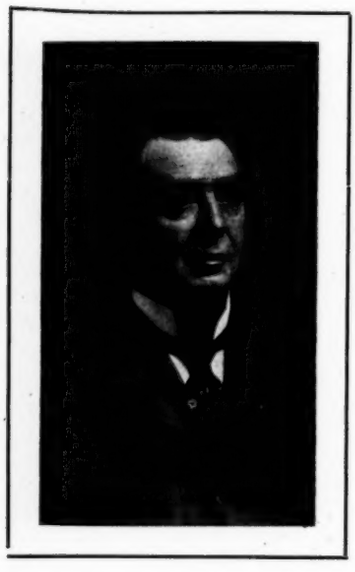
Legislative Situation in Pennsylvania.

Legislation in the state of Pennsylvania during the present session of the legislature has kept off the domain of the telephone, but there has been much talk of passing a public utilities act. There appear, however, to be so many diverse views as to what should be contained in such an act that it is by no means sure that any law will be passed.

The act as proposed by the attorney general provided for an interchange of facilities by telephone systems where not in active competition, but there appears to be considerable opposition to that from both the Independents and the Bell companies. However, there is so strong a demand for it from the people, that it is not at all unlikely that such legislation may be passed in Pennsylvania in the near future.

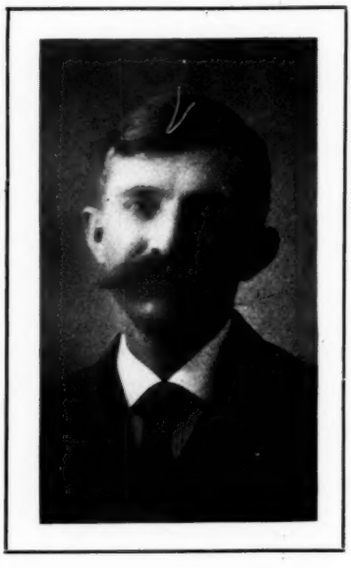
A Quartet of Men Prominent in the Telephone Field

WILLIAM J. CAMP, assistant manager of telegraphs of the Canadian Pacific Railway Co., Montreal, Que., was born at Oakville, Ontario. His first experience in telegraphy was with the Grand Trunk Railway at Prescott, Ontario. In 1874 he entered the employ of the Dominion Telegraph Co. as operator. In January, 1878, he became a railway train dispatcher on what is now a portion of the Canadian Pacific Railway, but returned to his old position of night chief of the Dominion company, later becoming day chief. When this company was consolidated with the Montreal Telegraph Co., in 1881, he was appointed local electrician at Montreal, which position he held until July, 1883. In 1884, he entered the service of the Canadian Pacific and in 1886 was made chief electrician over the whole system for the telegraph department. He became superintendent of the eastern division in 1899, and from 1903 to 1912 was electrical engineer for the entire system. Mr. Camp is an active member of the Association of Railway Telegraph Superintendents and was president of the association during 1908-1909.

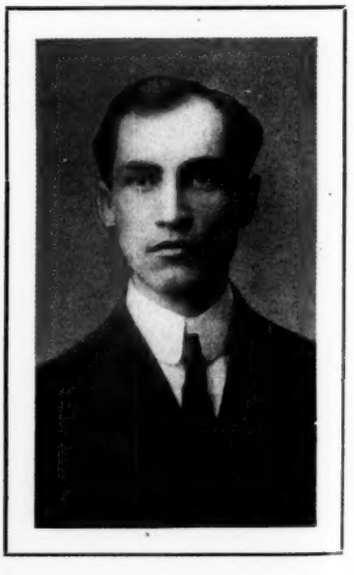


JOHN A. KICK, railway sales engineer of the Western Electric Co., with headquarters at Chicago, Ill., was born at Loudonville, O., Jan. 20, 1877. He entered the telegraph service in his home town in August, 1891. In 1892 he became an operator on the Ft. W. & C. R. R., remaining in that service until 1898, when at the outbreak of the Spanish-American war he enlisted and served in Porto Rico and the Philippines. In 1901 he became wire chief for the Standard Oil Co. Leaving this service he went with the American Telephone & Telegraph Co., at Chicago, in 1905, as wire chief and assistant chief operator. From February, 1906, to November, 1909, he was wire chief and telephone engineer for the C., B. & Q. R. R. During 1909-10 he was engaged in experimental work in typewriter-telegraph apparatus and in March, 1910, was appointed engigineer of the telegraph department of the New York Central Lines west. Mr. Kick is co-inventor of the Cummings-Kick typewriter-telegraph system and the inventor of a high speed selective system for train dispatching.

CLAUDE W. HORNE, of Benton, Ill., manager of the Ohio & Mississippi Valley Telephone Co., for the county of Franklin, Ill., was born at Rockport, Ind., in September, 1875, and received a common and high school education in the schools of Spencer county, Ind. He entered the telephone business in 1900 in southern Indiana, having been employed prior to that time by the Lyndell Electric Railway Co., St. Louis, Mo. In 1903 he was made lineman for the Dodgeville Telephone Co., Dodgeville, Wis., and later was made manager of the same system. He left the Dodgeville company in 1905 and went to southern Michigan where he superintended the building of many rural lines. He was employed by the Southern Michigan Telephone Co., of Burr Oak and Coldwater, Mich., and by the Farmers' Mutual Teleone Co., of Bronson, Mich. In 1910 he became connected with the Boswell Telephone Co., of Boswell, Ind., resigning from that company in 1912 to accept his present position as manager of the Ohio & Mississippi Valley Telephone Co. at Benton, Ill. Mr. Horne belongs to the Independent Order of Odd Fellows.



H. W. WIGHTMAN, head of the newly organized telephone department of the Union Electric Co., Pittsburg, Pa., was born at Eden, N. Y., in July, 1880, and received his education in the Eden high school, the Buffalo State Normal School, and by an electrical correspondence course. He entered the telephone business in 1903 as instrument setter for the Bell company at Buffalo, N. Y. Several months later he assisted in organizing the Eden Telephone Co. and acted as secretary and superintendent in building this exchange. In 1904 he became manager and superintendent of the North Collins Telephone Co., whose exchange, when built, was sold to the Federal Telephone & Telegraph Co. In the next four years he served as exchange manager at North Collins, N. Y., for the Federal company, at Mt. Morris, N. Y., for the Livingston County Telephone Co., and at Franklinville, N. Y., for the Franklinville Telephone Co. Since 1909 he has been salesman for the L. M. Ericsson Telephone Co. and the Kellogg Switchboard & Supply Co. On April 1, 1913, he joined the forces of the Union Electric Co. Mr. Wightman is a Mason.



State Commissions

Calling Attention to a Bad Habit—A Promise Not to Appeal

By J. C. Kelsey

I had to punch myself when I read last week's TELEPHONY. I did not believe I was honestly and truly awake when I read the little debate between the governor of New York and the president of the New York Telephone Co. I did not believe that it had gotten as far along as the state governors. But you and I have known for a long, long, time that whenever a case is heard before a state commission, it will be appealed, if contrary.

Last week's TELEPHONY had this account of a very remarkable conversation.

"If I could prevail on your company to obey the decisions of the commission without going to court over it, I think we could settle the question without trouble," said Governor Sulzer.

"We have never appealed from any decision of the commission yet," replied President Bethell.

Well, I am glad that this little game of preaching control by commissions, and practicing appeal in case of defeat has at last been called. Of course, the remark applies to the New York commission. But it hardly applies elsewhere.

What happened to the decision of the California commission which enforced physical connection? It was appealed! And what happened to the Hamilton, Ohio, case, the La-Crosse, Wisconsin, case; the Grand Ledge, Michigan, case? All of them appealed or an open avowment made that all the litigants would have to go clear to Washington.

All these cases involved compulsory physical connection —where the Bell Company has competing plants and is losing money, too. In no case has an inferior competing company asked for this privilege.

It has always reminded me of the average child. He will work like everything at what he likes. And sulk at what he dislikes.

The Bell company loudly preaches 2,500,000 voluntary physical connections. But for some silly reason is loudly talking the Thirteenth Amendment when anyone wants compulsory connection.

In every case I know of, this question of compulsory connection has come in a territory where it would pay the Bell company immensely. Yet they just won't have it, because it is not their pet way.

It may be that I am really awake. That the Bell company is going to pay attention to the commissions and obey them.

I rather thought they would appeal the Chicago case. But it seems that the masterly work of Professor Bemis was too much for them. And they saw the folly of going further.

It is a sensible declaration, too. People will feel better over the telephone question, if they can see legal buncombe abolished.

What is more foolish than having a silly lawyer shoot off his mouth before a commission and openly threaten to appeal? It hurts the whole principle of regulation. It is a dangerous thing, anyway, not to practice what you preach. That is what has been going on so far. Making the noise over monopoly under control for the public benefit, and then appealing fair decisions for the company's benefit.

It is fitting that Governor Sulzer has called the turn. I sincerely hope that the promise of the New York Bell company will extend to the other companies.

The time to fight a case right is at the very start—not after a half dozen appeals.

I notice in the same copy of TELEPHONY, that a legislative committee is in process of appointment to investigate the rates in the state, especially New York City. That costs a barrel of money, and the cost falls upon the telephone company, too.

It gets back to the thought often expressed, that the state commission, with our most enthusiastic assistance, should wipe out the dollar telephones and the free ones, so the rates on the high-priced telephones could be reduced voluntarily. This alone would eliminate 90 per cent. of the telephone cases.

The place to begin lies at the bottom. No company can give cut rate or free service without charging unjustly at the top.

This applies to the Bell companies more than to Independents. Their dollar telephones and free service hangs a terrible weight on the subscriber who is in the position to have to pay.

If the Bell company and every other company would cut out appeal and get earnestly into the game, the problems would soon be eliminated. The only problem is dollar telephones and free county or country-wide service on one side, and the high-priced telephone on the other.

The commission members are merely human and are anxious to do the right thing. That is about the only thing they can rely upon to hold their jobs.

It requires no stretch of the imagination to see the elimination of the abuses in telephone service, just as they were in early railroad service. It has been a great benefit to railroads to have passes eliminated, besides rebates and other grafts.

Would it not be fine if every telephone in your system earned not less than $1.50 per month, nor more than $3? And going further into larger companies, if the cheapest telephone was $2 per month, the highest rate would not need to exceed $4, and so on up. You could place your rates so that no subscriber would have any reason to complain and yet allow you a decent profit.

Reading further in last week's TELEPHONY, South Dakota plans a general telephone investigation. It is really a movement to eliminate free service and discrimination; to find out a true depreciation, one that will reconcile a rate petition and a bond or stock prospectus.

The trouble so far has been that a telephone company has had two problems. One to sell stock, the other to charge enough to pay dividends.

A stock prospectus is always a beautiful thing—it only speaks of silver linings. But in rate cases, every cloud is a dark one. Some King Solomon has a job of placing depreciation reserves in a frank and open position.

It takes no knowledge of a depreciation to know that a telephone company loses money on dollar telephones. Just why telephone companies even yet object to state commissions, when they are the only hope of dollar telephone elimination, I can't understand.

One can not expect all men to see alike. It will do no good to expect it—they won't.

I can't say just what influences are fighting commission

rule in Illinois, but I frankly believe that the average home company will make a mistake to object to control.

I have always urged full publcity. There is no harm in showing that you lose money.

I remember when I first started out, how Independents were so afraid to talk of this forbidden topic, because the Bell company might hear about it. I want to say here that the Bell company knows more about your affairs than you do, at least they think they do! But even if they do know all, what good will it do?

You are your own keeper. If you are in need of $18 per telephone to pay expenses and dividends and you take in $16, it does not matter if it is deadly secret—it will out!

There is but one measure of success in business. Your receipts must exceed your expenses. It is very simple!

The state commission comes nearer being a brother's keeper than any other service since industry began. Think of it—an organization to help you make money in your business! Can you beat it?

Men like to stand in their own light. I think it is because gratitude and appreciation are missing from the human system. It was Madam de Stael who said "the more I see of men, the more I like dogs. For dogs have what men have not, gratitude and appreciation."

You can look over the telephone business and see some queer cases. Many operators owe their start to extensive lines of credit from manufacturers. Yet today they have either sold to the Bell or are ordering goods from the Bell factory.

One cable manufacturer practically laid the foundation of our greatest successes, yet today the Bell factory, with slightly cheaper cable, can take the business away from them.

I know a man whose bank, telephone company, and reputation were saved by a manufacturer, yet true to human nature he hates the hand that saved him.

Nearly every one can tell stories of such human weaknesses.

Theodore Vail knew of such weakness when he cast the Bell factory into the open field. He knew that cut prices would attract even the most faithful customer, at least for a time.

Have you ever noticed—about this time, that the Bell company became anxious to furnish managers and wire chiefs to Independent companies? However disloyal some of these men may have been to the Bell company when in their employ, it is painful to observe how some of them overwork Bell loyalty when they become managers of Independent plants, especially when it comes to buying.

The psychology of the telephone business is as difficult as that of a winning baseball team.

The telephone man also knows that he can serve his subscribers faithfully for years, without the least assurance that they will stay by him if anyone came along with a quarter less!

That is why state commission control was given birth—to make the public remember their benefactors. That is why you want commission control. You started out with $1.50 and $1 service, and you thought you could get 300 subscribers. And you got 1,300 instead.

When you ask the 1,300 to pay you a little more than you charged in early days, a delegation of sore-headed men who had no stock, would call on the Bell company, or vice versa, and invite a new company in to compete with you.

Every concern which started under such circumstances has always come to grief, but the damage was done. That is why state control has the certificate of necessity feature—to prevent that damage.

You don't have to go far to see this. It comes awfully close to home, simply because men know not gratitude and have not appreciation—that is the fundamental theory of commission control, to guard such humans from their own follies of ingratitude.

Don't think because you are developing a good telephone man out of a poor piece of human flesh, that he will stay with you. He won't. And don't think that any human being can remember kindness. He can't! It was left out by the great Creator, for some reason.

That is why I think the loud noise about the public wanting one telephone, is wasted. Just as soon as they get one, they will want two.

They want just what they have not. That is why you want commission control. You can only capitalize your rights to public appreciation and gratitude in this way.

In spite of public fickleness, which is another word for human ingratitude, it is certain that the opinion of the public is given more heed these days. Public opinion, in early days, influenced Pontius Pilate. The Roman mob, by act of thumb, could liberate any prisoner. But after the Romans gave up to Goth and Vandal, public opinion went into oblivion.

After a thousand years, public opinion drove Spain out of the Netherlands, and gave the dainty degenerate French artistocrat to the guillotine. Then it went to sleep again. It got to rumbling a few years ago, so much so that old Vanderbilt gave it enough attention to say, "the public be damned!"

And even in my generation and yours, railroad and industrial magnates are very actively placing their ear to the ground, hoping to hear sweet approval from the public. Quite a change, too. But what has made publicity a permanent and virile weapon? Ease and facility of communication.

In the first place, printing gave birth to the power of public opinion. Newspapers of today make or break any man, public or private, or any enterprise. But a newspaper of today could not exist were it not for the wires.

In other words, the telephone and telegraph have changed our economic map. They have displaced king, emperor, czar and potentate. King Public Opinion rules the world!

Public opinion forgot the good deeds of Admiral Dewey in a day.

Wire and a newspaper, what else? Public opinion can as easily forget your good deeds in a telephone way.

They will turn from you and take Bell or Mutual to their bosoms. That is why you want another arm created by public opinion—state commission control.

It even seems as if public opinion mistrusts its own fickleness and lack of appreciation, and creates a body to make up for its shortcomings.

It was a great step in state control when Governor Sulzer revealed to President Bethel that he was onto the game. I hope that his resolution to abide by the decision of the state commissions will be passed along.

Appealing to a higher court is nothing but a makeshift to put off the evil day, merely to gain time. The commissions have the facts, and the upper Courts only wrestle with the legal fancies.

A resort to a higher court can be construed but as a waiting game, at least when applied to conpulsory physical connection.

MORAL: "The world do move."

Railway Telephony—Practical Points in All Branche

A Regular Department Which Appears Bi-Monthly—Scope Includes Principles of Construction, Testing, Operation and Maintenance—Columns Open for Contributions on Matters of General Interest to Those Engaged in This Branch of Telephony

Convention of Railway Telegraph Superintendents.

The complete program for the annual convention of the Association of Railway Telegraph Superintendents to be held at the Planters Hotel, St. Louis, May 20 to 23, has been announced. There will be an informal reception on Monday evening, May 19, at which time members, ladies and guests will register and receive the official badge of the association. Further registration, announcements and other official business will occupy the time Tuesday forenoon.

The real business of the convention will begin on Tuesday afternoon when a paper on "Some Facts Concerning Telephone Transmission" by Elam Miller and Chas. A. Robinson, of the engineering department of the American Telephone & Telegraph Co., of New York, will be read. This will be followed by a paper on "Use of the Telephone by Railroads for Dispatching Trains, Handling Messages, Etc.," by J. C. Johnson, superintendent of telegraph, Pennsylvania Railroad, Philadelphia, Pa., and also by a paper on "Inductive Disturbances as Affecting Telegraph and Telephone Circuits," by P. J. Howe, general plant department, Western Union Telegraph Co., New York.

Wednesday's program will include the following papers: "Protection Against Lightning and High Currents for Telegraph and Telephone Equipment," by M. H. Clapp, superintendent of telegraph, Northern Pacific Railway, St. Paul, Minn.; "Main Line Power for Selective Circuits, Including Transmission and Signaling," by Richard F. Spamer, engineer, sales department, Western Electric Co., New York; "Full Use of Wires," by H. D. Teed, superintendent telegraph, St. Louis and San Francisco Railroad, Springfield, Mo.; and "Organization for Maintenance of Lines," by M. C. Allen, division plant superintendent, Western Union Telegraph Co., New York. On Thursday a paper will be presented on "Organization for Wire Chiefs and Telephone Inspectors," by J. B. Sheldon, superintendent of telegraph, Union Pacific Railroad.

A ladies' reception committee will be in attendance at the hotel during the convention and will act as escorts to those unacquainted with the city, when desired. The entertainment provided for those attending the convention will include a trip by special private trolley cars to Shaw's Garden, the most noted botanical garden in America, and also to Strauss's studio, a trolley trip to Buckingham Club, a steel ferry boat ride on the Mississippi, an auto ride, a trolley ride to the Anheuser-Busch Brewery and a number of luncheons, dinners, etc.

The present officers of the Association of Railway Telegraph Superintendents are: President, J. B. Sheldon, U. P. R. R.; first vice-president, William Bennett, C. & N. W. Ry.; second vice-president, A. B. Taylor, N. Y. C. & H. R. R.; secretary and treasurer, P. W. Drew, M. St. P. & S. M. Ry.

It is expected that there will be an unusually large attendance this year. The papers have been selected with great care and the discussions are expectd to be very interesting.

Economies of Telephone Train Dispatching.

By J. A. Kick.

A definite statement including actual basic figures for comparison of the telegraph and telephone method of train dispatching is impossible. However, remote the possibility of actual comparative figures, there are other means of arriving at a satisfactory conclusion of a fair and impartial consideration of the relative merits of the two systems. Those who have been converted to the telephone dispatching method are firm believers in and enthusiastic rooters for the total transformation from telegraph to telephone. Their argument is based on safety, speed, flexibility and economy.

Arguments for Use of Telephone.

Safety is claimed by reason of the elimination of possibility of error by unskilled Morse operators and by the increased speed of operation allowing the dispatcher to base his orders on complete accurate information rather than on assumption.

Speed of operation is important to prompt movement of trains. Figures secured by comparison prove that the telephone train-dispatcher issues orders much faster than does the telegraph dispatcher. The regulation of speed of sending orders is based upon the ability of the receiving operators to write down the order rather than their ability to translate a code and write at the same time.

Saving in time by calling with selective signaling systems is great. It is safe to say that the telephone dispatcher can call, send and complete an order before the telegraph dispatcher will ordinarily be able to line up four or five average way stations, ready to start the order. This statement may not hold true in every case, but in the average it will be found very conservative. The telegraph delay is due to calling stations rather than to the actual sending of the order, although between two and one-half to three minutes is accepted as the average saving by the telephone over the telegraph method for actually sending and repeating the order after all stations have answered.

The dispatcher himself copies the order as he sends it, thus being permitted to carefully check each and every repetition. In emergencies, the dispatcher can get quick action by reason of his ability to ring, almost instantaneously, any one or a number of stations.

Speed in interchange of information is one of the very important gains in the change to telephone. It enables the dispatcher to keep better advised as to the local conditions and, at the same time, to more definitely direct the way station operators and the trainmen.

By the flexibility of the telephone dispatchers' circuits, I refer to the possibilities in installing an unlimited number of telephones at stations, switches and bridges; also portable at intervals of one mile, more or less, and distributed between stations; ability to work a number of branch lines on a main circuit without the introduction of adjustable repeating apparatus; ability to ring one station while working with another; and the control of signal lights, semaphores and various extension bell apparatus. In fact, a circuit which can be provided with legs and loops reaching every department and office on the division, with every employe capable of using the circuit and at the same time various other features, the limits of which are the capacity of the circuit to carry the business.

Economy is the true basis for the foundation of all business ventures but in the composite form. It is not correctly analyzed when one departmental or divisional unit

can capitalize a yearly saving with a much greater resultant loss to the other departments. It may not be possible to place the latter at fixed figures and it is lost sight of, as a consequence.

Economy is frequently represented in great expenditures. That is, heavy outlays for increased facilities, the net return on which represent yearly percentage returns in excess of common interest rates. Then, too, economy may be represented in expenditures that are charged as a no revenue earning investment, but which might be proved a heavy contributor to net earnings credited to other sources. As an instance, a railway may have a great mileage and great sources of traffic, but with either a shortage of cars or of power to handle the business offered, a loss is experienced that may be shown as a gain or a yearly saving of expenditures for car and power maintenance.

Then again all departments may be well provided for except the department of communication or the so-called "telegraph department." Unless ample and proper facilities are provided for accurate and prompt handling of all classes of its business, a loss to the other departments is as certain as the one in the first instance. Lack of facilities for prompt handling of telegrams may result in delays of many kinds, including loaded cars, empties for loading, foreign cars, reservations and many other vexing conditions of uncertainty which react through patrons being dissatisfied. Train dispatching is handling a number of trains, each of many cars. Prompt action, which gives maximum efficiency in operation, is the ideal as well as economical method.

By telegraphic train order methods, the dispatcher at times experiences the vexing necessity of delaying a train 30 minutes to an hour by reason of his being unable to issue orders fast enough to care for all trains. As a consequence, the train least important in class suffers the delay. Importance in class is not an indication of the importance in the earning power column, as the delayed train may be of 60 loads of dead freight with a maximum capacity power unit.

Let us consider that one hour and 30 minutes is the actual time loss per 24 hours for a given division, and that the tonnage capacity of the power is 4,000 tons. Then we have 2,190,000 tons delayed one hour, which is equivalent to 4,000 tons delayed 547.5 hours or at 12 hours running time for the division, 45 trips per year over the division for a maximum power unit. It will be seen that there will be expense for additional power and crews by reason of an additional crew to make up for the delayed movements of power, although there be no additional train movements.

This basis is too conservative, but is an example of a means for practical comparison by men who have actually operated under both methods and know the value of prompt movement of maximum power units. Such calculations must be based somewhat on assumption but figures relatively correct are available to the motive power department. They include investment in power units, maintenance and operating costs, including fuel and lubrication.

If the accumulated delays necessitate the continuous operation of one or more maximum power units, a close study of the fundamentals might disclose a possibility of improvement by investment in better directing facilities. The returns in the form of savings to the motive department would represent an attractive percentage return to financial department.

In these figures the saving by prompt handling of freight, release of loaded cars, delivery to connecting lines of per diem cars, and many other factors have not been taken into account, but there is represented in each a saving or loss depending upon the time en route.

Economy in telephone train dispatching is not entirely dependent upon the increased speed of operation of the circuit over that of telegraph. But there is the important feature of direct communication with trainmen, power departments and all others concerned and in such a pleasant and personal way as to invite closer acquaintance of the operatives, with the highest standard of co-operation as a result. Let each and every member of the force co-operate each with one and all, then old friend economy will be obviously present.

Conditions on railways are so unlike on any two divisions, that it is doubtful if any means of positive comparison of the relative costs and savings by telephone train dispatching over telegraph dispatching will ever be attempted except by assumption. Those who have been operating by telephone are so firmly convinced that they feel no need of comparison as the improvement and economy is too obvious to them. Those who have not been convinced are skeptical and, in some cases badly prejudiced, so that they are entrenched behind "Show the saving in dollars and cents." The result is that they are in a position to have little or no hope of conviction except by universal opinion.

Economy in train dispatching by telephone is not represented in saving in cost of operation or maintenance of the telephone circuit, but in the great good to all of the other departments. The same holds good throughout the department of communication, meaning that the greater and better the facilities for general communication, the less the delays and the closer the step from one department to another.

Efficiency in Operation of Telephone and Telegraph.

By John H. Finley.

The explanation of the duplex in the preceding article of this series, covers the ordinary type which may be designated as the series type to distinguish it from the later bridging type.

Fig. 4 shows the bridging conditions as there outlined. As in the series duplex, the signals are made by current reversals.

No change made at the home station will affect the bridged relay at this point but a change in polarity will affect the relay at the distant end. The operation is similar to that of the series type except only a part of the current flows through the relay, most of it flowing through the retardation coil.

Only one reversal of current will be followed out as the operation is almost identical in character with the series circuits. Considering then the conditions as they exist with positive current impressed at both ends of the line, there would

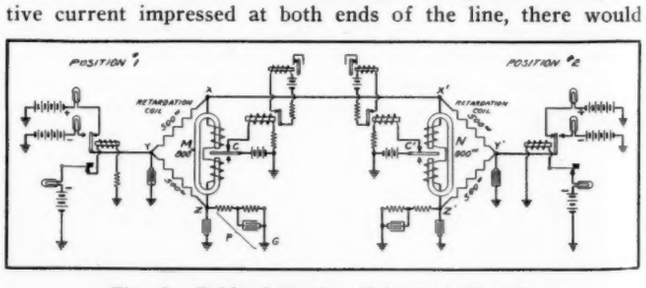


Fig. 4. Bridged Duplex Telegraph Circuit.

be a flow of current through the coils Y to X, Y to Z and X to Z at position No. 1 and a corresponding flow from Y' to X', Y' to Z' and X' to Z'. But current flowing through the relay, X to Z or X' to Z' would hold contact C or C' closed and current in the opposite direction or no current would open these contacts.

Suppose the battery is reversed at position No. 1, positive

current would then flow from Y' to X' and Y' to Z'. Since the line and apparatus combination represented by line X' to X, and balancing resistance from Z to ground, exactly balance in electrical effect, there would be no flow of current through the relay and contact C' would open; contact C would remain closed as there would still be a flow of current

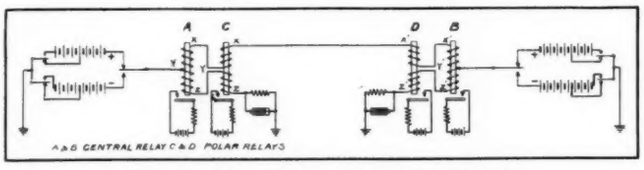


Fig. 5. Quadruplex Telegraph Circuit.

from X to Z. With negative battery at each end, which, of course, would occur in actual practice with both ends sending, both relays would stand open. The connections could, of course, be so made that the reverse would be true, that is the negative battery at both ends would close contacts C and C' and positive current open these contacts.

With the circuits arranged as outlined above however closing positive battery at position No. 1 would close contact C' and closing postive battery at position No. 2 would close contact C. There are several refinements introduced in these circuits in actual practice to make them more reliable in operation but for the purpose here it is not necessary to explain them.

The Postal Telegraph Co. has a little different way of producing the same results.

Quadruplex Telegraphy.

Fig. 5 shows a circuit arranged for sending four telegraph messages over the same wire at the same time, two from each end.

The use of this circuit depends on the principle of using not only two polarities but also two different voltages. In other words the quadruplex telegraph is a regular duplex to which has been added what is known as a common side, which consists of two voltages and a neutral relay at each end. The duplex feature of this circuit or the feature depending on

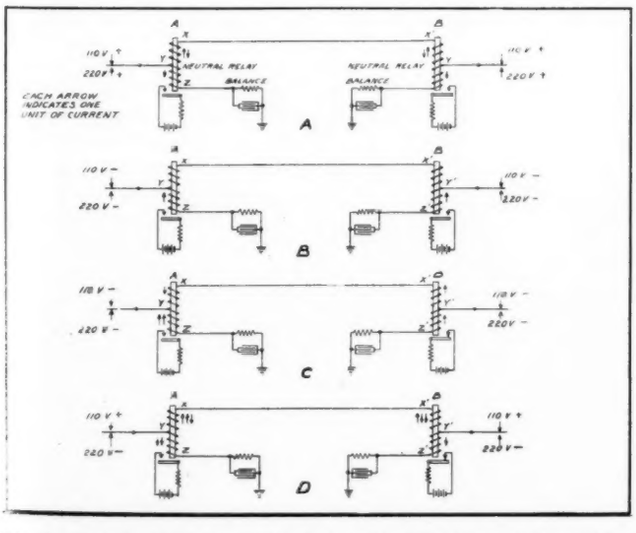


Fig. 6. Details of Duplex With Relays Under Different Conditions.

the different polarities of battery has been covered in the duplex explanation previously outlined.

The neutral arrangement, depending on different voltages, is operated as explained below. In this system, as in the case of the duplex, the line is balanced by an artificial line, the complete circuit being given in Fig. 4. For convenience in explanation, Fig. 6 outlines the different conditions as they exist in the neutral relay. For simplicity the polar relay is omitted in this sketch and only the neutral relay and the different voltages of battery are dealt with.

By noting Fig. 6 it will be seen that the operation of the armature depends not on the polarity of the operating current, but upon the strength only. This relay is so adjusted that it requires 220 volts or some fixed proportional voltage, through either half of the winding to operate it. In other words, it takes something more than the voltage of the lower battery to actuate it.

One hundred and ten volts has been assumed for this battery for convenience. It is understood, of course, that either battery may be positive or negative as indicated in Fig. 6.

Referring to Fig. 6-*A*, assume the condition where 110 volts positive current is impressed at both ends. Both relay armatures then open as indicated. This is true as one-half of both relays A and B are balanced or have no flow of current through this part of the winding and only 110 volts on the other halves. Hence the current is too weak to operate the armatures. If the polarity at either end is changed, the armature does not respond either, so long as the voltage remains the same at the ends. This may be explained by supposing the 110 volts at position A changed to negative, Fig. 6-*B*. From ground 110 volts then flows through the artificial line back to the 110 volt negatives. No current flows from position B over

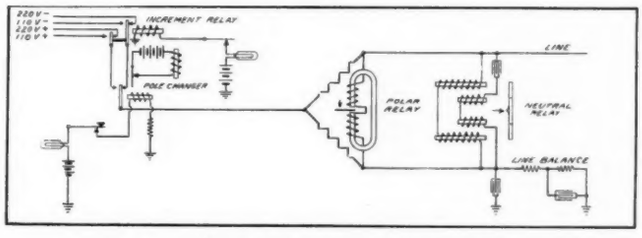


Fig. 7. Bridged Quadruplex Telegraph Circuit.

the line, since negative battery is impressed at both position A and position B. Therefore only 110 volts would be active in one-half of each relay and neither relay would operate.

Changing the voltage at either end, however, would operate the relay. In Fig. 6-*C* the polarities are alike, 110 volts negative at position B and 220 volts negative at position A. Then through winding Y' X' there would be a flow of current from 110 volt negative to 220 volt negative and through winding Z' Y' a current assisting it from the 110-volt terminal, or one effective unit of current through each half of relay B, and the armature would operate at position B. At position A, however, the conditions would be 220 volts through winding Z Y, and 110 volts through winding X Y opposing it. The relay would not operate, as there is an effective flow of only 110 volts through only one-half the winding.

If the potentials were different and 220 volts positive were impressed at position A and 110 volts negative at position B, Fig. 6-*D*, the conditions would be 220 volts through winding Y Z and 220 volts + 110 volts through winding Y X. These would oppose one another and the relay would not operate. At position B there would be —110 volts through Z' Y' and 220 volts + 110 volts through X' Y' acting in the opposing direction. There would therefore be an effective voltage through one-half the winding of 220 volts and the relay would operate.

To summarize the results by noting Fig. 4 and remembering that any change in polarity at either end would not affect the polar relay at that end but would operate the polar relay at the other end, it can be seen how the polar side of the quadruplex would work. Remembering that the neutral relay would not respond to any current less than the predetermined high voltage current, and also that current always flows from positive to negative, it will be seen how the neutral relay at the distant end will respond to changes in voltage in the operating end.

The bridge neutral relay operates a little differently inasmuch the flow of current through this relay is a differential proposition and part of the current only passes through the relay, the balance through the coil. The relay, similar to the bridged polar relay, will not respond to any changes made at the home station but will respond to changes in voltage made at the distant station. It makes no difference whether these increments are positive or negative. The circuit is shown in Fig. 7.

The small holding coil shown in conjunction with this relay is used to hold up the armature during the short interval while the pole changer is operating. This is accomplished by the discharge of the condenser in series with the coil, the discharge current being sufficient to hold the armature just the required interval.

The advantages of the bridging system over the older series system is that it is more reliable and operates on a wider margin. This means that a greater variation in line conditions could occur without interfering with the operation of the circuit.

(To be continued.)

Telephone Dispatching on Canadian Pacific.

The Canadian Pacific Railway, which has some 4,000 miles of single track, from the Pacific to the Atlantic, has a double copper circuit wire from St. John, N. B., to Vancouver, B. C., so that it is able to dispatch its trains by telephone now instead of telegraph. It is found that the telephone is quicker and more adaptable to emergencies; a skilled operator is not required; time can be saved, and communication had at once from or to any train, as the trains all carry apparatus which can be quickly attached to the line at any place.

Queries on Theory and Practice

Induction From Cable.

"Is it possible for a line to get induction through a lead sheath, paper cable when it is disconnected at the cable terminal? If so, state how and why it can be, and if a grounded sheath makes any difference?"

The Telephone Service Association furnishes the following to this query:

The induction would be caused by a split pair, leaky cable or an unbalanced line. This can be readily detected by putting a buzzer on the leaky pair. The noise would be heard on all other conductors in the cable. Grounding the sheath would not be certain to clear this trouble.

Locating Trouble on a Phantom.

"Will you please tell me the cause of the trouble we are having with the phantom circuit wired as shown in the enclosed sketch, Fig. 1? The distance from *A* to *B* is five miles; from *B* to *C* is two miles; from *B* to *D* is three miles; and from *B* to *E* is two miles. No. 7-*A* Stromberg-Carlson repeating coils are used and the line wires are of No. 12 copper.

When a party on the phantom circuit *DFE* talks to central or through central to any other line, the transmission is muffled and indistinct both ways, but with parties on the phantom talking to each other, it is normal in every sense.

We have tried disconnecting parties *F* to *E* but it did not affect the transmission from parties *F* to *D*. Also disconnecting *F* to *D* did not affect *F* to *E*. We connected a receiver from *K* to ground and in listening on conversations, the transmission was the same as when listening through the switchboard.

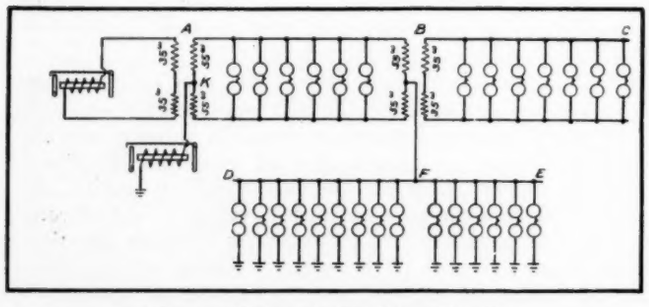


Fig. 1. Wiring of Phantom Circuit.

These same coils were used successfully on another phantom circuit. The metallic line is not grounded. There is no trouble with the ringing in any way. No 896 Stromberg-Carlson telephones with 1600-ohm ringers are used.

Would a high resistance joint in one side of the metallic circuit cause this trouble?"

It is evident that you have inductance somewhere in the path of the phantom circuit. If both sides of the repeating coils were balanced, so that each carried half of the current, they would neutralize each other, so that the resistance of the repeating coil would be nearly non-inductive to the phantom circuit current. A high resistance joint in the physical circuit will do this. It would have to be somewhere between *A* and *B*. We assume that the ringing on the physical circuit, clear through to *C*, is first class, showing that none of

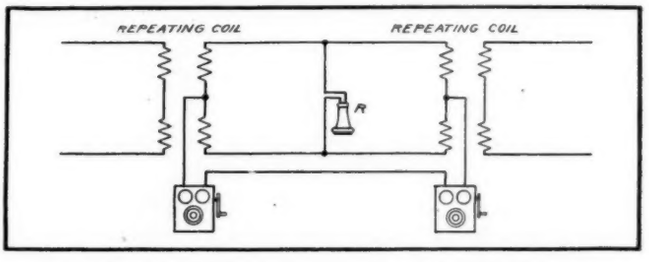


Fig. 2. Arrangement of Repeating Coils for Testing.

the windings of the repeating coils are reversed, a condition which will cause muffled talking on the phantom.

You can make a test as to the cause by short circuiting the metallic line at the central office, *A*, and putting a receiver from the shorted lines to earth. If the talking clears up, then the trouble is very likely between the line and the *K* coil. If it is due to a high resistance joint out on the line, it will clear up a little, but not what it should. Go out to the repeating coil at *B* and repeat the test, cutting off the line toward *A* while testing.

As a last resort, test the coils by arranging them as in Fig. 2. You should be able to talk easily through them. At the same time you should not be able to hear in the receiver, *R*, bridged across the terminals.

Operation of Fuse Alarm Circuit.

"Regarding the diagram, Fig. 39, on page 47 of the May 3rd issue of TELEPHONY, please explain more fully how the electromagnet works."

The operation of the circuit given in the diagram is the same as that of a night alarm circuit. It was intended to show an old drop for the electromagnet but, unfortunately, the drop armature was not indicated so that what was intended to represent the shutter would easily be taken for the armature, thus causing confusion in the reader's mind. When a fuse is blown, the entire current flows through the drop winding, throwing the drop shutter and causing the bell to ring if the cut out switch is closed.

Placing the Telephone Wires Underground in a Small City

How the Painesville, Ohio, Telephone Company Has Placed Its Wires Underground at Small Cost—Factors Which Were Influential in Decision to Use System Such As Used in Europe—Description of Plan with Cost Data

By C. M. Grauel

As a rule telephone practice in the United States is far ahead of that in Europe, but on a recent trip abroad several things were observed that seemed worth while investigating. The thing that interested me the most was the manner of placing cable underground, varying of course, in different countries and localities from the method used in this country to the most informal one of burying the cable, without any protection whatever, in a trench, just the same as one would lay water or gas pipe.

These operations were observed in several of the largest cities of Europe. I learned that such methods were used from the first use of lead encased cables, both power and telephone, and that some were still doing duty after having been in place 30 or 35 years.

Later when back at home and the question of rebuilding our outside plant came up, the recommendation of the engineer retained by the company, that we adopt a plan which would place all of our wires underground in a manner such as to afford sufficient protection and yet keep the cost down to the minimum, by following a plan similar to those observed abroad, was adopted. Comparative estimates prepared by the engineer, Allen C. Morse of Cleveland, Ohio, showed conclusively that the method proposed was cheaper in first cost, in maintenance and in depreciation.

The method proposed was to lay the cable in a trench, not to exceed two feet in depth, right on the earth in the bottom; to cover the cable with a strip of tar paper; and on top of that to place a layer of concrete three inches thick.

The trench was dug in the tree lawn or parking and where crossings under pavements, railroads, etc., were made, a single line of fiber duct was laid. The usual precautions against electrolysis were taken by use of frequent bonding. In addition, a special enamel coating was applied to the sheath wherever there was present in the soil, any slag, or ashes, or other filled in material that might have a chemical effect on the lead sheath.

Cost of Reconstruction.

The plant in Painesville was built 17 years ago, all open wire construction being used. It was remodelled ten years ago, at which time a limited subway was built consisting of about 15,000 feet of duct with 16 manholes. There was installed in the subway 7,650 feet of cable and about 20,000 feet more was put up aerially.

Considering that the reconstruction, which was immediately necessary last fall, was of the lines that had not been rebuilt at the time the aerial cable was installed and were those which would in any plan have to be cabled, it was easy to show the advantage of the method adopted, in first cost, and also to take up the entire work progressively, extending it over a considerable period. A portion consisting of about 19,000 feet of cable was installed last November, correcting the worst conditions we had. The cost worked out even better than the estimate, resulting in the following showing:

The cost of installing the cable including every expense of material and labor, terminals, protection, etc., but not including the cost of the cable itself was less than nine cents per foot. *This cost was less than it would have cost to have put it up aerially on an existing, substantial pole line.* If we had had to rebuild the pole line and put the cable up on it, the cost would have been more than twice as much, estimated at 20 cents per foot. If a subway system had been contemplated, the cost would have been more than three times as much for the space occupied; but as a conduit system is never installed without 100 per cent to 300 per cent. extra capacity, the cost of the extra ducts would not have been less than 15 cents per duct foot. So the cost would have run from 45 cents to 75 cents per foot, or even more, if placed under pavements.

Economical Life and Depreciation.

Our experience has shown that the economic life of aerial cable is from 10 to 12 years; that of a pole line about the same; and that a depreciation charge should be made for both of about 8 per cent. per year. That would mean on the amount installed last fall, if it had been done aerially, an annual charge of $300. We have assumed that the cable, as installed, will have a life of 20 years or more, though 25 years or more would not be unreasonable, and the necessary depreciation charge of 4 per cent. not allowing full recovery value, for the smaller sizes would cost more to recover than could be realized from them. This would make an annual charge of $76.

Our average annual maintenance cost per foot of cable for 10 years on underground cable has been about one-tenth of a cent, caused by one case of electrolysis; one defective splice, and one plumber trying to drive a pipe under the pavement, necessitating replacing an entire section of 100-pair cable. Our average maintenance cost for aerial cable has been about one-fourth of a cent per foot, per year, and we think that is low. We have assumed that two-tenths of a cent is ample to maintain our new cable and see no reason for thinking otherwise. This would mean a saving in maintenance of about $95 per year and with the saving on depreciation and on interest on the money saved in first cost, we would have a total saving of about $550 per year.

That is enough of that kind of dope, time only can tell what may be hoped for from this system. But, just considering first cost alone, the actual saving per foot of 12 cents and the interest on that added investment, would mean over $2,400 the first year and $136 every year thereafter. Reversing the proposition, one could afford to rebuild with this system every five or six years as against 12 years for aerial and yet be money ahead. The preceding figures do not include the cost of the cable, which in this case would have been the same size, no matter what style of construction was used.

It has been objected that this style of construction is not flexible. I think that objection has been answered by showing that the first cost is less than any other method. Therefore any changes or additions can be made at less cost than in any other, except in an existing subway, which indeed if one added the proportionate cost of the space occupied, would again make it more costly.

As to the cost of maintenance in comparison with the old style or open wire which was replaced, an immediate

effect was felt to the extent of very nearly the services of one man.

We have had many criticisms and nearly every possible objection raised to the system and think that we have anticipated all that were worth considering. We are now installing 21,000 feet more and propose to put the entire plant, except country lines, underground, as fast as the condition of the old work justifies it.

RESULTS WITH UNPROTECTED CABLES.

Personally I have had experience with three cases of this kind of work: one here in Painesville, a lateral buried without any protection; a piece in Perry, Ohio, that I recommended to be laid in the same manner nine years ago, which goes under three railroads, one of which is electric. I had a part of this cable uncovered this spring at the point where deterioration was most likely to have occurred and it showed none. In fact it was, when washed clean almost as bright as the day it was put in. I could not help thinking of what the difference would have been if it had been suspended in the air over these railroad tracks.

The third case was in Mentor, Ohio, where a small piece was laid under a railroad right in the slag fill. It went bad in a very short time, due perhaps to the presence of sulphur in the slag forming sulphuric acid with water and eating the lead, or what is more probable, that the mechanical movement, caused by the trains passing over it, literally chewed the sheath to pieces.

As to the liability of its being dug into by the plumbers and others who have occasion to dig into the streets, the protective covering of concrete would prevent nearly all such cases and, where it did not, an ignorant laborer would dig into a subway just as surely. When one considers that we will have no trouble from falling trees in wind storms; no trouble from light wires; no fear of sleet storms or bullets of the small boy, it can be seen that we contemplate without fear, a few cases caused by someone digging into it. The ease with which one can locate trouble in this system is another thing in its favor, as it is easily accessible and repairs are made at a minimum of cost.

The distribution was made from poles here and there along the route and copper clad, duplex wire was used for drops, thereby eliminating two-thirds of the poles, all of the crossarms and open wire.

We had formerly, where this cable was placed, from three to seven arms of wire mostly from 12 to 15 years old and more trees than one in the business cares to see. In fact almost all of the cross arms taken down were side arms.

Distribution could have been made underground from the cable, direct to the house, but at an increased cost. This was not considered here as it would involve an installation charge, which was not considered advisable.

In conclusion I would state that it seems to me that this method will be the solution of many difficulties encountered by the small companies. When it is known that this work can be installed cheaper than one can rebuild existing old lines, the cost of cable will not be considered as out of the reach of even the smallest companies. At Perry, Ohio, with 225 subscribers, they have 2,300 feet of this cable. In another town near Painesville, they are about to install 23,000 feet of cable in the same manner as we did and that company has only 275 subscribers.

A 900-Mile Telephone Talk in Europe.

The Austrian telegraph administration recently decided to establish a telephone line connecting Vienna with Dalmatia according to an article in a recent issue of The Electrical News. The line from Vienna follows a southerly course and passes over a number of islands in the Adriatic Sea to the coast of Dalmatia. The line therefore consists of both aerial and submarine cable. The aerial line is of bronze wire, five mm. in diameter. The cable connecting the mainland and the islands has a total length of 60 km. (38 miles).

Considering the great distance between the terminal points, which was approximately 815 km. (510 miles), the principal difficulty was in the choice of a submarine cable. As guttapercha cables of the ordinary construction are not suitable for telephone work there were only two constructions, which in principle are totally different from each other, namely, the Pupin and the Krarup systems, that is either a cable with self induction inserted at certain definite points or distributed uniformly over the whole length. It was finally decided that for the telephone line in question the construction of the cable on the Krarup system would be most suitable.

The cables contain four cores, the construction of each core being as follows: The copper strand consists of a central copper wire surrounded by three flat tapes and has a sectional area of about 5.5 square mm. in all. This copper strand is closely wound with three layers of soft iron wire, .2 mm. in diameter, and is insulated with guttapercha of a special quality to a diameter of 8.4 mm. To minimize the "leakage," a guttapercha mixture was chosen which, according to test, was found specially adapted for the purpose. The cores are laid together in pairs and the two pairs are again stranded. The four cores are finally served with brass tape as a protection against the teredo. The main cable is sheathed with 24 galvanized iron wires of 5.7 mm. diameter and the shore end with 20 such wires of 7.1 mm. diameter. The laying of these cables was carried out in much the same way as is the laying of telegraph cables. A cargo steamer was equipped with the necessary machinery and the work of laying carried out without difficulty.

After having made the permanent connection between the cable and the aerial line, the speaking trials which were made from Zara with the terminal station at Vienna gave excellent results. The tone was loud and the articulation very clear, distinct and well maintained in spite of the great length of cable. An abnormal leakage from the aerial line is prevalent in this district, caused chiefly by the insulators and iron brackets becoming covered with a thick precipitation of salt which is deposited at times to a depth of ½ inch. For this reason a line loaded with higher self induction would have been of less advantage.

"Cross talking" such as is sometimes met with in telephone cables was not noticeable with the cable supplied. Further experiments have proved also that both pairs of cores are entirely free from induction.

Further extensions of the line have recently been completed and speaking trials have been carried out between Vienna and Sarajewo, a distance of about 900 miles.

Previous to the laying of the telephone cables described, speaking trials were made to determine to what extent the volume of sound and the tone of voice would be altered when both pairs of cores were connected in series, thus giving a cable 120 km. (75 miles) in length. Even over this length of cable which was further connected in series with about 500 miles of aerial line, the trials are reported to have proven entirely satisfactory.

Switching Arrangements at Freeport, Cal.

The railroad commission rendered a decision denying the application of the new Freeport Telephone & Telegraph Co. for permission to raise its local rates. The company operates in a territory near Sacramento. Investigation by the commission enabled the applicant to obtain modified switching arrangements with the Pacific Telephone & Telegraph Co., which will serve to increase materially its revenue. With this adjustment it is said that the increase in rates was found unnecessary.

The Telephone Inspector and the Troubleman

Continuation of a Series of Articles Begun in the September 7 Issue of Telephony—They Deal in an Elementary and Explicit Manner With Many of the Problems Encountered by Telephone Men in the Operation of Small Exchanges

By A. E. Dobbs

THE COMMON RETURN SYSTEM AGAIN.

"Could you," asked Mr. Risk of George one morning, "build a common return system that would answer as well as metallic circuits in exchanges having from 100 to 1,000 subscribers?"

"Well," replied the superintendent, "it is so hard to get just the apparatus we want for this kind of work, and as the metallic circuit constitutes an ideal system for telephone work, I would favor that where circumstances and financial considerations allow it. At the same time, a common return for a small plan in the country away from disturbing electrical influences can be made practically as good as a metallic circuit. But to prevent cross talk and noise on the lines, it is necessary that the ringer coils as well as the drop coils should be wound to high resistance. I think we discussed this matter once before, but perhaps it would be well to consider it further."

"It must not be forgotten," George continued, taking a piece of paper and starting to make a drawing, "that a common return wire connects all the telephones in multiple. Here's a sketch (Fig. 67) of the circuit showing stations Nos. 2 and 4 connected. When a subscriber is up on the board, while his own ringer and drop are cut out, his talk not only comes back through the return wire, but divides through *all the other lines* connected with that return wire as well. To prove that this is the case, simply cut the return wire here at point *A*. If there should be 30 or 40 telephones on that return, they would talk almost if not altogether as well, without being connected with the office at all. And in some plants where there is a great deal of disturbance from electric light and trolley sources, the service might often be more satisfactory if all the return wires were dead-ended, that is, cut off at the office pole.

"I know a case of one plant in which this was done. The office I speak of has about 300 telephones and four leads. Each lead has its own common return wire, independent of all the others. This sketch (Fig. 68) shows the idea. Neither return connects with the others at all. Hence if a line should get a little noisy, it would not affect the lines on any other lead.

"In a case of this kind the current, instead of coming back

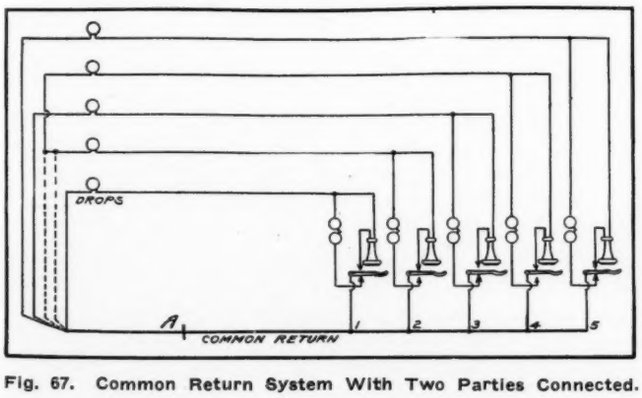


Fig. 67. Common Return System With Two Parties Connected.

to the switchboard over the common return wire, comes back altogether over the other lines. Of course it must not be forgotten that the drops are also all connected with each other by another and shorter common return which does not go outside of the office, or at least no further than the cable pole. It must be remembered that with this system at least 25 subscribers on one return are necessary in order to prevent cross talk, and the more subscribers you get on it, the better it talks.

"Now these two systems (Fig. 67 and 68) are quite different in their action. In this case (Fig. 67) high resistance

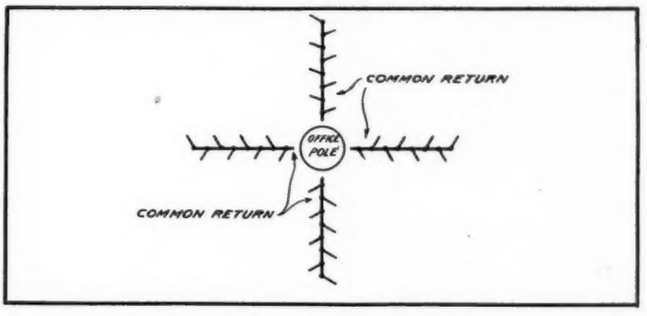


Fig. 68. System Having Several Separate Common Return Wires.

drops and ringers are used in order to keep as much of the current as possible on the common return wire where it belongs, and to keep it from straying onto the other lines. In this other case (Fig. 68) low-wound ringers can be used, as the talk goes back on the other lines. Still it is better to have these wound to a rather high resistance in order that the current may be choked back and divided equally among all of them. Of course, the resistance of the return wire in either case should balance the combined resistance of all the lines, drops, and coils opposed to it. It must not be forgotten that the resistance of this return wire can be too *low* as well as too high."

"Can you give me an example of that?" asked Will, who was listening attentively.

"Why, yes," answered George. "If the average resistance of the ringers is 100 ohms, the resistance of the drops, 150 ohms, and the average resistance of the lines, 50 ohms, it would make a total average resistance for each line of 300 ohms. Now, supposing that we had 100 subscribers on the lead, the combined resistance would be 300 divided by 100, or 3 ohms, and the resistance of your return wire should also be 3 ohms for an average distance from the office. Suppose that your average distance from the office be taken as half a mile, the resistance of the return wire, we will say, should therefore be 3 ohms for this half mile, or a wire having a resistance of 6 ohms to the mile. Looking over our wire tables, you will find that No. 10 B. & S. copper wire comes nearer to this than anything else. Therefore that would be the proper size, and once adopted this size should be carried out to the end of the lead.

"When the return is connected at the office, the best plan is to build the lines metallic from the switchboard to the cable pole. At the cable pole, split the pair, connecting one side to the line and the other to a bus bar, to which the return wire can also be connected. In this way the return wire for each lead can be kept separate from the rest. And if it is desired to give any subscriber a metallic circuit, all that has to be done is to disconnect the ground side of his pair from the bus bar and continue it to the place required."

"Would there not be less cross talk in this system (Fig. 68) if all four of those leads were joined together?" questioned the manager, referring to one of the sketches.

"Yes," replied George, "but he would have more trouble from inductive disturbances. In this case he does not get induction on any lead that does not belong to it, hence a more perfect balance. Here," he continued, making a sketch (Fig. 69), "let us remember that the earth currents, and hence the earth induction, is in no two parts of the town, or country, either, for that matter, exactly the same. In towns this potential difference, along the line of a trolley road especially, may vary from 50 to 300 volts. As there is no such a thing as perfect insulation, these differences try to equalize themselves by coming back over the wires, which are better conductors than the earth. All of this throws the lines badly out of balance, especially if the common return is grounded as is often the case. Now, by cutting the common return at these points (*C* and *D*) we confine the disturbance, belonging to each lead, to its own section."

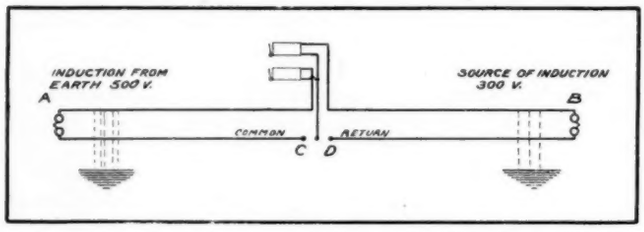


Fig. 69. Cutting Common Return to Eliminate Cross Talk.

"Why does not that difference equalize itself over the other lines?" queried Will.

"Because the stray, foreign, and induced currents do not affect all the lines equally, as they will be stronger on one lead than on the other. If the return is cut as I have indicated, the ringers and drop coils will force equalization and confine the current to its own section, so that you do not have more current on your common return than on the subscribers' lines, which would knock good conversation endways.

"In a town where there are electric light and trolley disturbances, it is better not to ground the common return at all. I know that it is sometimes a great deal of trouble to run two wires out to some isolated residence. But it will be better to do that, than to have noisy lines and kicks every day from subscribers."

"While I think of it," George remarked after a short pause, during which the manager left the room, "there are a few 'dont's' that you ought to memorize.

"Don't run out a steel wire from the main line return and leg on four or five subscribers, unless you are indifferent to the service you give.

"Don't have any bad joints in your main return, unless you want cross talk in the telephones and swear words from your subscribers.

"If your return wire is not grounded, keep it as carefully insulated as the rest of the line.

"If your return wire is grounded, ground it only in one place and insulate all the rest, in order to keep away from contacts with different earth potentials."

"What do you mean by that word potential?" asked Will.

"Potential difference is the difference in electrical pressure between two points and is generally expressed in volts," answered the superintendent as he walked toward the door.

(To be continued.)

Applying J. C. Kelsey's Principles.

A well-deserved appreciation of J. S. Kelsey, financial editor of TELEPHONY, was printed in the May 2 issue of the California Sentinel, of California, Pa. The Sentinel reprints in full Mr. Kelsey's "Lessons from the Flood," which appeared in the April 13 issue of TELEPHONY, and calls attention to the fact that it has a bearing on the local situation, as the Union Telephone Co. will raise its rates July 1.

Introductory to the reproduction of the TELEPHONY article, the Sentinel says:

"The author of the following article enjoys the distinction of being one of the best authorities on the telephone question, from an operating as well as expert manufacturing standpoint. Mr. Kelsey, for a number of years has been considered among the best of scientific experts along this line, and has appeared before investigating committees to give expert testimony in nearly every state in the Union, and in Canada and foreign countries as well. His word is accepted as final by many who have had long experience. Inasmuch as the Union Telephone Co. will raise its rates July 1st, the article by Mr. Kelsey should receive the careful attention of all Union subscribers. Mr. Kelsey conducts a department in TELEPHONY, the only weekly telephone journal, and has often declared that no telephone rental should be less than $1.50 per month. He claims that in telephone systems depreciation will average nearer $4 per year per telephone than less, and gives figures to substantiate his assertion. We do not know anyone else who makes such a claim, but many figure depreciation from $2.50 to $3.50.

While the Union Telephone Co. has regularly paid dividends until last January, the company did not have a surplus with which to purchase the new equipment needed at that time and as a result a dividend was skipped. Appearances indicate that the exchequer will be low when the time for the July dividend rolls around. This condition has gradually crept upon the company, and they have realized for nearly four years that a rise in rates must eventually come. Last January it was decided that rates should be raised July 1st, but the amount of the increase was not determined. It is well known that the rates at Roscoe, Belle Vernon, and Charleroi—places that enjoy the same free district as California—are $12, $18 and $24. These rates would seem just here, inasmuch as Union subscribers enjoy the same privileges and in addition have Brownsville.

These rates do not mean, however, that Union subscribers will be compelled to pay much more than they are now paying, because of the new four-party system which the company is installing. As far back as two years ago, the directors were familiar with the fact that either a four-party system must be installed or more cable strung. The latter course would cost, at the least estimate, $3,000, probably more, and at the same time the expense ration per telephone would increase. So the alternative—the four-party system—was adopted. Because subscribers have enjoyed straight line service at a nominal price, they are inclined to throw up their hands in horror at the suggestion of four-party service. They will find this system far better than they expect. If the subscribers are not willing to stand for the increase in rates they owe to the company to give the new service a fair trial. The Sentinel is now using an Automaphone and is much pleased with it.

For the past two months the company has been trying out lines with four parties on each line and the people are pleased —in fact they have better service than by the old cranking process. Undoubtedly a few will wish to retain the straight line service, but not many, in view of the many advantages of the four-party Automaphones. The rates on country lines will probably be raised but 25 cents per month."

Mr. Kelsey's article then follows, showing the need for telephone companies charging a reasonable rate so that provision for an adequate depreciation fund may be made.

Interest in Telephone Service Association.

Great interest in the Telephone Service Association and its objects is being manifested by telephone companies in all parts of the country. Manager Frank L. Eldridge is daily receiving letters asking for information regarding various difficulties companies experience. These are promptly answered by members of the engineering and other committees of the association.

There is a big demand for the book of operating rules and regulations, which as stated in last week's issue, has just been published. Among the companies which have called for them are the Tri-State Telephone & Telegraph Co., St. Paul, Minn., which ordered 500 copies, and the Inter-State Independent Telephone & Telegraph Co., Aurora, Ill., which ordered 200 copies.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

Telephone Control by Commission.

A pertinent criticism of state commission regulation of the telephone business is incorporated in an editorial in a recent issue of The Public. The editorial is entitled "Utilities Commissions as Monopoly Shelters," and with reference to the operation of the commissions of Ohio and Michigan, says:

"In both states no new (telephone) company can secure a franchise without the consent of the public utilities commission. The original purpose of this provision was to protect the monopoly of present companies when they are 'good,' and to regulate their rates and service in the interests of the people. But it has, in fact, operated to entrench monopoly, irrespective of the kind of service rendered. The commissions are so careful to conserve vested rights that the people find it very difficult to secure adequate service at reasonable rates. This situation has been brought about because the commissions place more stress on the sacredness of monopolistic property rights than they do on the needs of the people. It has been brought about for the further reason that entrenched monopoly always is arrogant and oppressive, viewing its patrons for their possibilities as revenue producers instead of viewing itself as a public servant. All over Michigan and Ohio that state of affairs has created a spirit of revolt. Note the steps by which, in every instance, this spirit finds expression. In a large number of towns and villages the first move is an indignation meeting, where a protest is made against existing rates or service. To this protest the telephone company pays no attention. The merchants and farmers then organize and form a stock company. In this way they raise funds with which they try to purchase the telephone plant; but in every case a prohibitive price is asked. Then the new organization applies to the public utilities commission for a franchise. The hearings drag along through many weary months, and at last the application is 'turned down.' If the local service is not wholly intolerable, this delay and the final refusal to grant a franchise wears out the patience of the stockholders of the new organization, and the old company is left master of the situation.

Fortunately for the people, however, the service usually is so poor that the people are ready to go any length to secure relief. By experience they then find that there is only one way to do this. They must organize as a mutual company to operate at cost without profit. Organized in this way, they do not come under the jurisdiction of the public utilities commission. There are many practical objections to this form of organization, but it is a case of 'Hobson's choice.' They are met at once by the old company, which goes into the courts to secure a temporary injunction. Thus another delay is inevitable. At the hearing of the injunction farmers and business men attend court in a body; and when the argument has been presented, not the least convincing part of which may be their personal presence, the judge, who is elected for a short term and not appointed for life, dissolves the injunction. Then the new system may be built; or, the old company, baffled at last, may sell for a reasonable price.

With it all, however, there has been at least a year of obstacles and delay from the date of organization to the time when construction begins; and all because the people have no local self-government on such questions, but are under the jurisdiction of a commission not responsible directly to them."

The writer of the above points out that the moral of the situation described is that office holders (meaning the members of the commissions) should be directly responsible to the people they serve under the initiative, referendum and recall.

Important Public Utility Case in Michigan.

An important public utility case the outcome of which is watched by telephone companies with more than ordinary interest, is on the calendar of the present term of the circuit court of Eaton County, Mich. Whatever the immediate outcome of the case it is likely to go to the supreme court.

The action is one brought by the Vermontville Farmers' Independent Telephone Co. against the Michigan Railroad Commission. The suit is brought for the purpose of having set aside an order made by the railroad commission denying the company the right to establish and operate a telephone exchange in Eaton county.

The telephone company was organized at Vermontville in January, 1912, under the public acts of Michigan permitting such organization. It was granted authority to issue its capital stock of $25,000, 2,500 shares at $10 each, such authority being granted by the commission. One thousand shares were sold on February 27 of that year and the company filed the required application showing the purposes for which the fund thus raised were to be expended. On August 29 following, the railroad commission denied the right of the petition to grant authority to do business and refused to issue the necessary certificate. The reason assigned by the commission was that The Citizens' company was already in operation in the county, running out of Grand Rapids and that the Michigan State Telephone Co. was at the time extending its lines into Eaton county, and alleging that the proposed Independent company would cause an unnecessary duplication of lines and fixed expenses and that the new company would also cause a division of earnings to the injury if not the destruction of one or the other of the competing companies.

The Independent company is composed of leading farmers and business men in the county and a large list of subscribers had been secured. The case is regarded as a test action which will be watched with interest from other states as well as Michigan.

Governor of Michigan Signs Bayliss Bill.

Governor Ferris has signed the Bayliss telephone bill passed by the legislature recently adjourned, which places the telephone companies doing business in the state under the jurisdiction of the state railroad commission with broader powers than under the old law.

Bell Losses in Canada Charged to Independents.

The Bell Telephone Co., of Canada, recently made an application before the Dominion Board of Railway Commissioners, which has jurisdiction over telephones and telegraphs as well as railways, at its recent session in Toronto, for an order to discontinue the interchange of long distance service with the Ingersoll Telephone Co., the Blenheim & South Kent Telephone Co., the People's Telephone Co. of Forest, the South Lambton Telephone Co-operative Association, the Markham & Pickering Telephone Co., the Niagara District Telephone Co., the Brussels Telephone Co., and the Wheatley Telephone Co. The board heard the argument of M. K. Cowan, K. C., representing the Bell company, and of representatives of the different towns, and reserved its judgment.

Mr. Cowan urged the rescinding of the order for interchange on the ground that these Independent companies competing against the Bell company had injured its business, and that the revenue derived from the interchange system did not warrant the continuance of the service. Mr. Cowan produced a booklet showing the ratios of increase and decrease in business at these places. Representatives of the Independent companies claimed that if the Bell lost business in these towns it was not

the fault of the competing companies. They showed that this was due to an extra fifteen cents levied for outgoing long-distance messages from any of these points. The Independent companies do not share in the division of the extra charge, and it was pointed out that if this charge was dispensed with, the volume of business would be much larger. H. Gamble, K. C., represented the Independent lines.

Regulation of Telephone Companies in Ontario.

The matter of public regulation or ownership of telephone companies in Ontario is engaging the serious attention of the provincial government. Hon. I. B. Lucas, who has devoted considerable time and study to the telephone situation, and who was the chairman of a special legislative committee which conducted an inquiry into the problem of rural telephones in Ontario, spent some time last summer in Great Britain studying the situation there, in which investigation he had the co-operation and assistance of the British postal department, which has charge of telephone service in Great Britain.

Mr. Lucas added an amendment to his bill respecting telephone systems, which is among those which have just received the Royal assent after being passed by the Ontario legislature, providing that any association owning a private telephone line may become incorporated if three-fourths of its members vote for incorporation, on condition that they purchase the shares of their associates who do not desire to come into the company. Where a member of the association provides poles, wires, etc., but does not desire to come into the company, he may be reimbursed for his material. Disputes in settling such dealings may be settled by arbitration.

Earnings of Government Telephones in Canada.

The Manitoba government telephones are showing month after month a comfortable and growing increase of revenue over expenses, the reduction in operating expenses causing in three months recently a net balance of more than $111,000. The Alberta government telephones likewise are paying expenses and providing a good surplus.

Mississippi Telephone Rate Case.

At a recent hearing before the Mississippi Railroad Commission, which on its own initiative, is inquiring into telephone rates in the state to determine the advisability of a general reduction, over 40 telephone men were in attendance. Representatives of small mutual and Independent lines were heard first and their testimony was that if the commission were to order lower rates than now prevail, it would practically put them out of business.

A number of officials of the Cumberland Telephone & Telegraph Co. also testified. Vice-president Leland Hume of that company said that under the heavy expense of maintenance his company could not stand the effect of a general rate reduction.

Pennsylvania Independents Protest Against Rates.

At a recent hearing at Harrisburg, Pa., before the Pennsylvania Railroad Commission in its investigation of telephone rates instituted in response to the resolution of Representative Coniff, of Luzerne county, the representatives of Independent companies were present in force to protest against the rate reductions proposed by the commission. These rates, it was declared, would be ruinous and would drive the Independent companies out of the business, leaving the field to the Bell company.

Harry Tracey, receiver for the Cumberland Valley Telephone Co., Harrisburg, declared that three of the chief Independent lines were now in the hands of receivers and that the suggested rates would prevent rehabilitation. He estimated that the three Independent companies would lose more than $100,000 a year, and their net returns would be made 2 per cent. on the money invested.

The losses he estimated thus: Keystone Telephone Co., Philadelphia, $54,000; Cumberland Valley Telephone Co., $28,000; United American Telephone Co., Harisburg, $36,000.

"The rates are as low today as is possible to make them and bring a reasonable return to the investors," said Mr. Tracey. "The Independent lines were formed to get cheaper rates. As a result the excessive rates disappeared, and they are as low today in Pennsylvania as anywhere in the country."

Mr. Tracey said $53,230,000 was invested in Independent lines in Pennsylvania last year, the wages paid were $1,900,000, with 200,000 telephones installed. Receipts last year were $4,535,000 and expenditures for maintenance and reserve $4,000,000. The gross receipts amount to from 7 to 8 per cent. and net earnings about 3½ per cent.

Total receipts of the Cumberland Valley company last year were $35,000, declared Mr. Tracey, and if the suggested rates went into effect the company would lose $28,645, leaving nothing for maintenance.

Objection was also made by Mr. Tracey to the flat rate in the eighth class, that of the small towns of from 5,000 to 8,000 population. He said 90 per cent. of the Independent business is in these communities, where it is proposed to reduce the rates from $18 a year for four-party lines to $11. He said no reasonable service can be given at a profit for less than $18 a year.

In concluding Mr. Tracey quoted rates which existed before the independents came into the field and charged that the Bell company established farmers' lines at $5 a year to break up competition.

James Collins Jones represented the Keystone Telephone Co. and said his company had invested $7,900,000 in Philadelphia and had never paid a dividend. Last year the receipts were $300,000 and $60,000 was placed in the reserve, leaving $240,000 to pay interest.

He contended that the proposed rates would be confiscatory and that any course which would eliminate the Independents would be against public policy. The proposed classification as to unlimited service in Philadelphia would injure the Keystone, he said, but would benefit the Bell, reducing the Keystone rate from $90 to $78. The Independents, he said, stimulate service, and if the commission is not careful it will wipe out competition. Lyman D. Gilbert, representing the United American Telephone Co. also spoke against the reduction.

The Bell Telephone Co. will have a hearing some time next week. A number of questions about the suggested reductions have been asked by this company.

E. W. Bemis on Chicago Telephone Ordinance.

At a recent meeting of the Human Rights Party in Chicago E. W. Bemis, expert for the comittee on gas, oil and electric light of the city council of Chicago, which has recently completed its work of drafting the new telephone ordinance, said in part:

"The average dividend of the Chicago Telephone Co. is about 13 per cent; its dividend is never less than 8 per cent. We want to increase the salaries of the girl operators of telephones a total of $195,000. Measured service should be made universal, because unlimited service is very often abused. Numerous cases have been found where music and language lessons have been given over the telephone. This is a decided abuse of the privilege."

Miss Belle Squire, another speaker, made objection to a guarantee for telephone use." The gas company doesn't charge anything for the use of its meter," she said. "I can use as

much or as little gas as I please, and pay for just what I use. I don't have to subsidize the electric light company for the use of its wires, but I do have to subsidize the telephone company."

Suit Over Disregard of Ordinance Rates at Pana, Ill.

City Attorney Arthur Fitzpatrick of Pana, Ill., has filed suit against the Christian County Telephone Co., on the ground that the company charges rates for the use of telephones in excess of a provision of the city ordinances. Some months ago the company sent out cards asking the users of telephones whether they would welcome improvements in the system and a slight raise in rates. Over 50 per cent. of the answers sanctioned the improvements as well as the increase in rates, and thereupon the company made extensive improvements.

The ordinance, however, provides that the company shall not charge more than $1.50 for residence telephones nor over $2 for business telephones. The company is now charging $1.25 for residence service, but for business service is making a charge of $2.50, the latter rate being 50 cents in excess of the ordinance provision. Warren Penwell, the president of the company, is quoted as stating that the company will fight the suit and if it loses will raise the price of residence telephones from $1.25 to the ordinance rate of $1.50. The endeavor will be made to show that the ordinance is invalid and that the council has no right to set a price on telephone service in the city.

Central Union Telephone Case.

In the action brought before Judge Dever at Chicago by the minority stockholders of the Central Union Telephone Co. for the appointment of a receiver for that company to prevent its profits from being absorbed by the American Telephone & Telegraph Co., Stephen A. Foster declared in his closing argument for the minority interests that the directors of the company owned none of its stock prior to the institution of proceedings against them on February 28. He said that the stock they now hold was thrust upon them after the proceedings were started. He did not think that the court would consider the directors any less "dummies" by reason of these recent purchases of stock.

Finances of City Telephone System at Brookings, S. D.

The city auditor of Brookings, S. D., in a recent letter to the mayor of Mitchell, S. D., gave the following information respecting the finances of the Brookings telephone system, which is operated by the city:

"The rates charged for telephones are as follows: Business telephones, $2.50 per month, residence telephones, single lines, $1.50 and party lines $1.00 per month respectively.

"The city purchased the plant in June, 1903, for $18,000, since which the plant has paid all of its own expenses. We have a new set of poles and lines complete. We have paid $9,000 of the debt and the money is on hand to pay the balance July 1, 1913."

Paducah, Ky., Case Before U. S. Supreme Court.

Arguments were recently presented before the United States Supreme Court at Washington, D. C., in the case of Paducah, Ky., against the East Tennessee Telephone Co. in an action to oust the telephone company from the city under the contention that the defendant is operating without a franchise. The company claims to be operating under an old grant of the legislature.

Bills in the Wisconsin Assembly.

The Kneen bill to prevent duplication of telephone systems in rural districts, without first obtaining a certificate of public convenience and necessity from the railroad commission, has been sent to engrossment by the Wisconsin assembly. Legislators who favored co-operative companies organized for mutual benefit, opposed the bill, but the vote by which it was advanced was so large that the measure will probably pass the lower house without further opposition. The present law prevents duplication in cities and the Kneen bill extends the principle to towns. Assemblyman Kneen, the author of the bill, is the manager of the Bangor Telephone Co.

The assembly has killed the Minkley bill to permit cities to establish a telephone system without authority from the railroad commission. The public utilities law permits a town, village or city to buy the existing telephone plant at any time at a value to be fixed by the railroad commission.

The Holmes stock and bond bill has been ordered engrossed in the house. This bill permits the issuance of capital stock to the amount of the actual value of physical property. Independent telephone companies favor the bill, as many of them have not issued stock to the value of their property and will not be allowed to do so if this bill does not pass.

Wisconsin Line Required to Charge for Toll Service.

The Railroad Commission of Wisconsin has announced a decision ordering the Lodi Telephone Co. to improve its lines and service, and to make toll charges on some lines where heretofore the service has been given without charge. Complaint was made by citizens that the lines were overloaded, that the company refused to extend its service to applicants, and that the service in general was not up to standard.

The order of the commission provides that the company shall build a metallic line from the central office in Lodi to the junction of the Troy and Honey Creek lines and that additional wires shall be placed in service. Toll charges of ten cents for each message from Lodi to Prairie du Sac and Poynette are also to be placed in effect. The company is given until July 1 to make the improvements.

Oklahoma Company Must File Contracts.

The Oklahoma Corporation Commission has made final its order requiring all railroads, steam or electric; telephone and telegraph companies, gas and electric light, heat and power companies and all other public service corporations coming under the jurisdiction of the commission to file with the commission copies of all contracts, leases, agreements, or arrangements with other persons and companies affecting the carriage or transportation of persons or property or relating to the transmission of message or communications between points in the state of Oklahoma, or to the handling, use or rental of lines, equipment or facilities.

When any contract is terminated or changed, the parties are required to notify the commission by letter of such changes or terminations.

Declares Baltimore Rates Are Not Too High.

F. H. Bethell, of the Chesapeake & Potomac Telephone Co., has filed with the Public Service Commission of Maryland the telephone company's answer to the complaint of the Protective Telephone Association of Baltimore, represented by Dr. A. R. L. Dohme, in which he specifically denies the charges made by the association.

Taking each one of them separately, Mr. Bethell answered them in detail, beginning with the specific denial of the allegation that the telephone charges in Baltimore are excessive. He stated that more than 96 per cent. of the subscribers in Baltimore, on direct lines, pay a lower rate than subscribers in Chicago; nearly 88 per cent. pay less than in Cleveland, nearly 82 per cent. less than in St. Louis and more than 91 per cent. less than in Cincinnati. Mr. Bethel said that the reductions made in accordance with the order of the commission made it difficult for the company to earn the dividend of 8 per cent., which the commission had declared to be fair and reasonable.

Practical Subjects—Letters and Discussions

Letters from a Retired Lineman to His Nephew.

Podunk Valley Farm.

Dear Ben:

Well, Ben, Doc Stuver has the laugh on the town again, and a good one, too—one that will last for several weeks. Yes, sir, and some of them think Doc knows as much about rats as the next one. It was like this:

For all the ammunition that was used, the rats increased. About all the dogs were poisoned. Anything a rat would eat had to be kept in an iron box. There was no scarcity of rats.

No. Bill Suggs owns the elevator and felt a little responsible for letting the rats get starved off his premises, so he concluded he'd coax them back to their old homes. He bought a couple of loads of corn and put it in a large bin on the ground floor. He took great care to leave holes for the rats to get into the bin. A good many of them went back, a few thousand all told. Doc says they were the nervous ones and wanted to get away from the noise of the artillery.

After Bill got them back, another idea dawned upon him. He concluded to trap them in the empty bin and have a grand killing. He rigged some lights in the bin, fixing shades over them so they could be turned on by pulling a

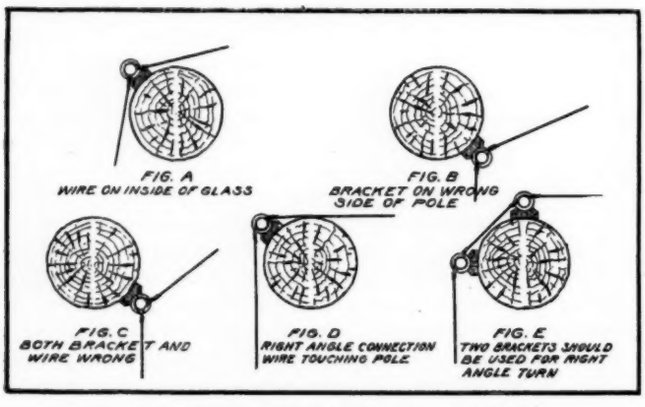


FIG. A
WIRE ON INSIDE OF GLASS
FIG. B
BRACKET ON WRONG SIDE OF POLE
FIG. C
BOTH BRACKET AND WIRE WRONG
FIG. D
RIGHT ANGLE CONNECTION WIRE TOUCHING POLE
FIG. E
TWO BRACKETS SHOULD BE USED FOR RIGHT ANGLE TURN

Fig. 1. Wrong Methods—One Correct Way.

string when all was ready. Also he fixed slides to cover the holes so the rats could not get out of the bins.

The other night when the rats were holding high carnival in the bin, all was made ready for the slaughter. Bill and about 15 others with 16 different kinds of clubs, waited at the door of the bin; also the two remaining dogs that were too fat and lazy to hustle out and get a piece of poisoned bait, were pressed into service.

It was funny that no two of those fellows agreed upon the best kind of a club to use at a rat killing and I don't know that they agree at this time.

Doc told them what they were up against. Told them that rats were dangerous and they'd better overlook the job. But they laughed at him. Doc wanted to know if I wouldn't like to see the fun, and so I went with him as a spectator.

When everything was ready, Bill pulled the slides over the holes and the shades off the lamps, threw open the door and the gang rushed in, throwing the dogs in ahead of them.

There was an awful rumpus in the bin for a few minutes, and then there was a bigger one. Of all the cries and yelps —well, you never will hear anything like it.

"Stand a little to one side," Doc said, "you're in direct range of the cyclone that's going to pass in a few minutes." And he was right.

Suddenly the door burst open and the valiant gang, festooned with rats, rushed out into the moonlight, followed by one limping dog. The other died in battle.

I put in most of the night helping the two doctors cauterize rat bites. Some of them have proved pretty serious at that, and only three dead rats were found on the battle field.

The wind has been pretty steady so far this spring and

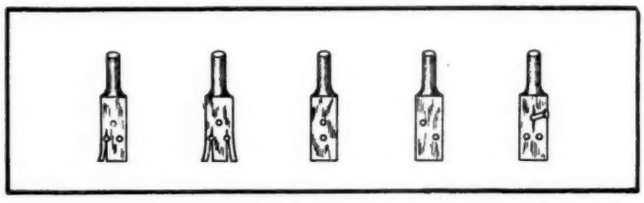


Fig. 2. Samples of Brackets Frequently Seen.

I've been on several pretty long trouble trips. About a month ago, they shipped me a supply of light line material; asked me to take a few glass pins and the wires with me on my trips, and look over the line on my way back for any repairs I could make. I've found a spot down the line aways where oak pins were used and I've replaced several nearly every trip. Any other wood but locust or osage continues to shrink after it is seasoned and therefore will not do for pins. In a few years the glass begin to "lift." The same applies to brackets, except that wires on brackets are seldom subjected to a "lifting" strain.

Have run across several poles with a one to two foot pull where the wires on the inside were pulling on the ties. Little things of this nature are too often overlooked after a line is once built.

Speaking of bracket lines I presume nearly half the telephone lines out in the country are of that class, still there is very little in the way of specifications covering them. They are generally built by inexperienced men and there are many faults to be found. Yet a line of this class is just as important for certain use as toll and long distance lines. Take corner poles for instance.

It is easy to point out several customary wrong ways of carrying the wires around the poles. Here are some of them in this sketch (Fig. 1).

If a right angle turn must be made, which in case of a light line saves the extra guying that would be necessary on a two-pole turn, it should be made by using two brackets

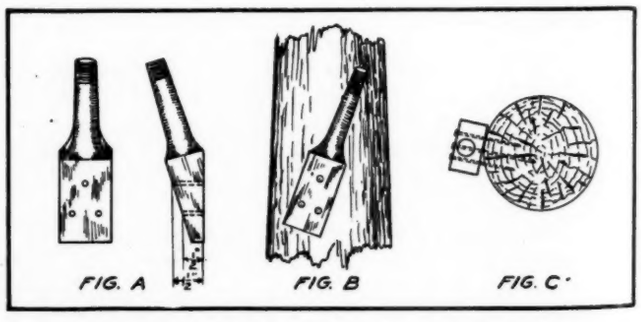


Fig. 3. Methods of Attaching Brackets to Poles.

as I have sketched them, giving plenty of clearance from the pole.

It requires a little skill and common sense to fasten brackets to poles properly. Here (Fig. 2) are some samples you will see frequently. Three nails should always be used in soft wood poles, one twenty-penny and two eight-penny; in hard wood poles, one sixteen and two sixes; all of the gal-

vanized wire type. Brackets should be bored for the nails, as I have indicated in the sketch (Fig. 3-*A*).

Placing the bracket on a pole is another matter worth consideration. You often see them like this (Fig. 3-*B*) to overcome the uneven surface of the pole, and also like this (Fig. 3-*C*). In either and all cases, the pole should be faced slightly with a hand axe or draw shave to form a firm rest for the flat face of the bracket.

Bracket lines may not interest you much, still you will find that even on your important lines such attachments are sometimes made on a "pin metal" basis. See that they are properly made. Where two wires are put up, they should be on the same side of the pole for two reasons. They will not bother the climbers as much and are not so apt to swing together in long spans.

Tweedles can't tell which it was who got its tail under the rocker a few weeks ago. It has been a matter of considerable animated discussion among the children. The rats are not quite as much under foot as they were. Uncle Dick.

Electric Lighting for Motorcycles.

Considerable interest has recently been shown regarding electric lighting for motorcycles. The writer has been experimenting along this line for several years with fairly satisfactory results, says M. D. Cooper in the Electrical Review and Western Electrician. A résumé of the results may be of interest.

Reflector.—A number of automobile side lamps are to be found on the market which may be adapted to motorcycle service by placing a mounting lug on both sides, instead of only on one side. This reflector has an opening of about six inches, focal length of 0.75 inch, and is equipped with a focusing screw which enables the rider to adjust for a spreading or concentrated beam at will.

Lamp.—The writer has found that an eight candle power lamp will give enough light for ordinary riding. In riding about city streets, the street illumination is ordinarily sufficient for road watching purposes, and the eight candle power lamp is not so blinding to pedestrians, as would be a lamp of higher candle power. When out in the country beyond the confusing glare of arc lamps, an eight candle power lamp will give light enough to discern a brick in the road at a distance of over 100 feet and "non-illuminated" vehicles can be discerned at a distance of 300 or 400 feet. Besides the concentrated beam, enough light is thrown to the roadway directly ahead so that even the smallest obstacles may be discerned.

The lamp first used was a two-volt lamp with a V-shaped filament. One of these lamps withstood 2,000 miles of travel over all kinds of roads. The shape of filament was not adaptable to parabolic reflectors, however, as it gave a striated beam of light. A coiled-filament, four-volt lamp was found to be very much more satisfactory as regards light distribution and had sufficient strength to withstand a 1,000-mile trip over the worst roads the writer has ever experienced.

Battery.—In the writer's experiments the candle power of the lamp was limited by the battery capacity. An 18-ampere-hour single-cell storage battery, (size 3 by 3 by 6 inches) originally designed for a hand lantern, was the only commercial product available, but carrying space was found for two of these cells, enabling the use of a four-volt, two-ampere, 8-candle power lamp.

The subject of motorcycle lighting is now receiving the attention of battery manufacturers, and it is believed that a battery of greater capacity will be developed. It is to be hoped that a six-volt battery will be perfected, so that standard automobile lamps may be used. It is manifestly impossible to make a three-cell battery (six volts) that will be small enough for mounting in the framework below the tanks of motorcycles. Hence battery development will probably tend toward a battery, say 4 by 8 or 10 inches and 3 to 5 inches high, that can be mounted above the tank, after the prevalent manner of carrying compressed gas tanks. With a battery of this size, a high candle power lamp (16 to 24) could be used.

Mounting.—When applied to a single cylinder motorcycle, the writer experienced practically no difficulty due to mechanical weakness of the lighting equipment. When used on a high-power, twin machine, however, extra heavy special mountings had to be provided to keep the parts from shaking off, due to vibration. The internal construction of the battery also proved too delicate for the severe strain. As previously mentioned the lamps are relatively stronger than the other accessories.

Whatever apparatus is used must be of strong construction and rigidly mounted.

General Systems.—Since practically all motorcycle magnetos are of the high tension type, they cannot be used directly for lighting. A low tension magneto or generator, in order to deliver even as much as 10 or 15 watts, would have to be of such a size and weight as to make it impracticable for this purpose. Attempts are being made to produce such a generator or magneto, but the outlook is not promising.

Conductors of Cable Pairs Cross Connected in Splicing.

A peculiar situation was met with recently in testing out a 25-pair cable by the well known method of red-to-white connections. The white insulated wire of each pair was connected at the outer end to the red of another pair until the last pair was reached, the white of which was grounded. This enabled one person to test out the cable from the inner end with a bell circuit.

The testing went on successfully until conductor No. 23 was reached, the white of which was grounded, showing that this should be the last pair or No. 26. The remaining

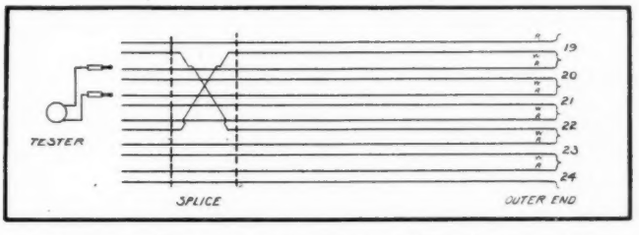


Diagram Showing Cable Conductors Wrongly Connected.

three pairs were found, by testing, to be connected in a circle—each red to the white of another pair. No connection could be established between these pairs and the 23 consecutive pairs already tested out.

When located, the trouble was easily remedied. The cable in question contained one splice, but there were no cases of open wires, shorts or grounds. The outer end connections were all found to be correct. After correcting this trouble, the 26 pairs all tested O. K.

To the question of, "What was the trouble?" may be given this answer: The white wires of pairs No. 19 and 22 were reversed in splicing the cable. The result was the state of affairs shown in the diagram. Pairs Nos. 20, 21, and 22 were left connected in a circle, while the tester after connecting on the white of 19 found the red of 23 and called it 20. The correct solution was found by chance.

Woodbine, Iowa. H. A. Kinney.

Exchange of Service Approved by Ohio Commission.

The Public Service Commission of Ohio has approved an application for the sale of the exchange property of the Central District Telephone Co., at Hanoverton, Columbiana county, Ohio, and its telephone line between Hanoverton and Kensington, to the Eastern Ohio Telephone Co. and has approved the establishment of a physical connection between the two systems for the purpose of providing an interchange of service.

Practical Telephony for the Practical Exchange Manager

A Series of Articles Relating to the Construction, Maintenance and Operation of a Moderate Size Telephone Exchange, Which Began in the Issue of September 21, Expressed in Everyday Terms, Easily Understood—Principles Easily Applied

By H. R. Van Deventer

On most telephone sets the ringers are properly adjusted at the factory and will operate under ordinary conditions without changing. On very long or heavily loaded lines, it is sometimes necessary to change the adjustment by bringing the armature nearer the cores of the spools. This is accomplished in various ways depending on the make of ringer.

When the armature is adjusted to be nearer or further away from the cores, the throw of the clapper is altered and the position of the gongs in relation thereto must be altered. The following points should be observed.

Ringer Maintenance.

1. The armature should be so adjusted that it vibrates freely under regular line conditions when a distant station is ringing.

2. The gongs should then be set so that when the armature is pressed against first one core and the other, the clapper almost but not quite touches each gong. The distance between the clapper and gong may be about 1/32 of an inch.

3. Under all circumstances, avoid bending the clapper rod. This should be centrally located in reference to the gongs so that each gong is struck with equal force.

4. If the gongs are not being struck equally, the gong that is struck the heavier, should be moved away from the clapper. This procedure gives better results than moving the lighter struck gong towards the clapper.

Perhaps the most annoying trouble in connection with ringers is the tendency for the armature to stick or freeze. The clapper will lie against one gong and if a party calls there may be a faint buzz or rattle but not a good ring. If the clapper is moved with the finger, it will start ringing and will ring all right for a time, perhaps half a day or more, but will again stick.

Sometimes the telephone will ring its own bell all right, but cannot be called by others. This trouble is more evident on long and heavily loaded lines than on short ones. Such thoubles are caused either by foreign current on the telephone line, it having become crossed with a telegraph or electric light current, or else the iron in the cores of the spools has become permanently magnetized.

The first-mentioned cause will usually manifest itself, in addition to the ways already described, in that the clapper will tend to stick positively to one side. If moved to the other side, with the finger, it will immediately return to its original position. Reversing the line wires on the top of the instrument will make the clapper move to the opposite side, while rapidly reversing the wire, will make the bell ring.

The second cause, that of the iron in the cores having become permanently magnetized, is by far the most common. This fault is really one of manufacture. It is a defect which is very hard to detect and sometimes a few ringers will get out of the factory in spite of anything the manufacturer can do.

The cores of the ringer spools are made from Norway iron, which is a special grade that will not become permanently magnetized. This iron reaches the manufacturer in rods and is cut up in screw machines, threaded, the ends knurled, and the pieces otherwise made into shape for ringer cores. After all of the work on the iron has been completed, it is necessary to thoroughly anneal the cores, for cutting, threading them, etc., hardens the material so that it will tend to remain magnetized, which is fatal to the successful operation of the ringer. The cores are therefore annealed by packing them in charcoal or some other suitable material, in cast iron boxes and subjecting them to a uniform heat for quite a while, after which they are allowed to cool very slowly.

Now if all of these processes are not very carefully carried out, the cores will not be thoroughly non-magnetic. That is, they will not be in a condition to rapidly reverse the direction of magnetism in them, which is a necessary qualification in the ringer.

To ascertain that the cores are in the proper condition requires great care, and in spite of all the manufacturers can do, sometimes a few cores will get out which are so hard as to cause sticking. When this trouble is met with, the ringer spools should be returned to the manufacturers so that a new set of spools can be substituted.

In extreme cases, where it is impossible to do this, or on old ringers which the troubleman desires to fix up himself, it will be necessary to take off the wire and carefully drive the heads off the cores. Then thoroughly anneal the cores by heating them to a cherry red in a closed iron pot, which may be filled with finely divided charcoal or ordinary coal ashes. Let the fire die out and do not remove the pot from the fire. Cover it with ashes and let it cool very slowly. After the annealing, be very careful not to file or otherwise work on the cores or it will harden them again. The heads may then be pushed on the cores and they may be rewound. This treatment if properly carried out will eliminate sticking. It may sometimes happen that the armature is bound in the pivots on which it rocks, thereby making the ringer sluggish. But this is a rare occurrence and is easily detected.

Ringer Windings.

An "open" ringer winding can be readily located by placing a receiver in series with one of the wires leading to the coils and then having someone at a distant station, ring. Some sound will be heard, even if the ringer is open. With a little practice, however, the difference between a good and bad ringer is easily determined.

It is seldom that the windings become short circuited and when this happens, it is usually caused by the leading-in wires coming in contact with the metal frame of the ringer. Careful examination should be made of these, also of the connection between the coils which is usually hidden back of the magnet yoke, as it sometimes gets in contact with the magnet. When this occurs and one of the leading-in terminals is bent down so that it touches the frame, one of the coils will be short circuited.

For the sake of uniformity, it is advisable that all of the ringers on the same line be of the same resistance. Sets of 1,600-ohms are recommended as a standard for country party lines and it is doubtful if a higher resistance than this is advisable except under certain special conditions. It is true that ringers have been furnished having

a resistance of 2,500-ohms, but it must be apparent that the spools are wound with extremely fine wire, rendering them particularly susceptible to burn outs and other troubles.

So far as the effect on the transmission is concerned, it makes very little difference whether the line is equipped

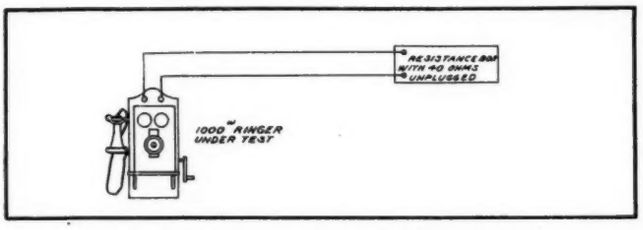


Fig. 41. Arrangement for Testing Ringers.

with 10, 1,000-ohm ringers or 10, 2,500-ohm. The impedance of a 1,000-ohm ringer to high frequency voice currents is enormous, being so great that the difference between it and the 2,500-ohm ringer would not be worth while. A 1,600-ohm ringer has a little over 10,000 turns per spool and a 2,500-ohm ringer, 13,000 turns. As the 1,600-ohm ringer across the line only affects the transmission 2 or 3 per cent., the additional impedance of the 3,000 turns which, incidentally, are on the outside of the coil and therefore do not affect the impedance in proportion, would be but a fraction of 1 per cent.

As a means of quickly testing ringers in the exchange, a shunt coil may be prepared having a resistance of 40 ohms. This may be placed across the terminals of the telephone, as shown in Fig. 41. If a 1,000-ohm ringer, it will operate well from its own generator with this shunt across the terminals. Turning the generator at the usual speed, it may be said that the ringer is operating in connection with about 25 others of the same resistance. This offers a quick way of testing and adjusting ringers in the exchange before the instruments are put out on the line, while the efficiency of different ringers may also be compared.

It is obvious that if ringers of one make will operate perfectly with the shunt in place, and ringers of another make fail to operate, the former ringer is the better. By making the shunt a variable, which can be done by using an ordinary resistance box, the ringers may be compared in terms of per cent.

(To be continued.)

Telephone Expansion in Northern California.

W. E. Hills, Scott Hendricks and A. J. Mathews, of Sacramento, Cal., are reported to have purchased the controlling interest in the California & Oregon Telegraph Co., and to have leased for a period of years the line of the Nevada, California & Oregon Telegraph & Telephone Co. between Reno, Nev., and Lakeview, Ore. The California & Oregon Telegraph Co., which has always handled a telepnone business so far as its facilities would permit, will now branch out and construct standard telephone toll lines and exchanges as well as operate its telegraph business in the northern country. The toll lines and exchanges will be operated in connection with the leased line of the Nevada, California & Oregon Co., known as the Dunnaway line.

The largest exchange will immediately be built at Alturas and it is the aim of Hendricks, Hills and Mathews to furnish up-to-date telephone service in Alturas, as they have done at Susanville and vicinity with the California Northern Telephone & Telegraph Co.

Under the rearrangement of wires contemplated, the California & Oregon Telegraph Co. will operate all telephone and telegraph business north of Doyle with a telegraph and telephone outlet to Reno and the California Northern Telephone & Telegraph Co. will operate all the telephone business in the vicinity of Susanville as heretofore. However, a direct circuit will be provided between Susanville and Reno which will give Susanville and vicinity a first-class telephone service to long distance points.

The California Northern Co. will also operate the Susanville office of the Western Union Telegraph Co. as soon as that company builds its line to Susanville along the Southern Pacific Railroad.

North of Doyle to Lakeview the lines will be rearranged to give the Alturas and Lakeview vicinities a good long distance telephone service.

The California & Oregon Telegraph Co. has made a traffic agreement with the Pacific Telephone & Telegraph Co. for long distance messages from Doyle to points in California. On account of the rapid development in Lassen and Modoc counties in California and Lake county in Oregon the company will do a large business.

Poles Used in Canada in 1911.

The Canadian Department of the Interior has just issued a report on poles and cross ties used in Canada during 1911. The statistics regarding poles were obtained from reports from 282 companies made up of 129 electric light and power concerns, 102 telephone companies, 28 electric roads, 19 steam railways and four telegraph companies. These companies were divided into two main classes, first, steam railway, telephone and telegraph; second, electric railways, power and light. This classification seemed best from the fact that steam roads operate telephone and telegraph lines in connection with their railways and many electric roads distribute power and light.

The total number of poles purchased was 585,703, at an average cost of $1.80. The cost of the various kinds of wood were as follows: red pine, $13.16; white pine, $10.70; yellow pine, $9.33; chestnut, $5.25; Douglas fir, $3.79; western cedar, $2.99; hemlock, $1.68; cedar, $1.61; larch, 1.43; spruce, $1.02; and jack pine, 89 cents. Cedar was by far the most generally used, representing about 80 per cent. of the total, with western cedar second and larch third. The use of spruce pole is also increasing, nearly 9,000 being used during the past year.

Tables given in the report cover the number of poles, the total cost and the average cost for different lengths. Poles of 20 to 25 ft. lengths constitute 58 per cent. of the total and cost on an average, $1.12; 26 to 30 ft. lengths were 17 per cent. of the total and averaged $2.17; 31 to 35 ft. lengths were 3 per cent. of the total and averaged $3.65 each; 36 to 40 ft. lengths were 3 per cent. of the total and cost $4.93 each; 34 ft. and over were 2 per cent. of the total, averaging $8.25 each.

Question of Conduit Rates at Toledo.

Objections have been filed by the Central Union Telephone Co., Toledo, Ohio, to the provisions in the contract with the city for the use of conduits on the Cherry street bridge and a conference has been arranged between telephone officials, City Solicitor Schrieber and Service Director Cowell relative to the matter. One clause to which objection is made provides that the city may change the rates every five years. The clause will be changed to read that the rates may be changed every five years subject to arbitration. The initial rates will be 7 cents per duct foot for conduits and 3 cents per duct foot for conduits reserved. The other objection was to a provision that the city may take over the equipment of the telephone company in the conduits at any time. The company desires the ordinance to provide that the cables can not be purchased unless the entire telephone system is taken over by the city. This is at present under discussion.

In the Rural Line Districts

Clint Lighter was out fixing the telephone lines Friday and Saturday. Line No. 3 has been ringing on No. 1 all winter. It has also been tangled up with several others.—Moneta Minutes Primghar (Ia.) Bell.

John Mayberry has been busy along the telephone line several days the past week and two new boxes have been added, the line now extending to Santee. Mr. Obert and Mr. Gumm of Santee, are now on the line. This makes a large number of boxes on one line, but the line is being double wired a portion of the way from town and when the work completed, we will have better service.—Niobrara (Neb.) Tribune.

Charley Young, the faithful lineman of the Missouri River Telephone Company, with headquarters at Geddes, was doing some work on the company's line at this place on Friday.—Wheeler (So. Dak.) Courier.

D. E. Newton is tearing down the old telephone building preparatory to moving it to his ranch, where he will construct a small house.—Woodridge Item, Stockton (Calif.) Record.

The telephone companies have purchased the building on the corner where the switch board is now of Minne Riggs.—Bellmore News Rockville (Ind.) Times.

Fred Hilkemeier has been kept busy of late, trying to locate the trouble on the telephone line. He discovered it, and now our line is in working order.—Garfield Township Item, Hitchcock (S. D.) News-Leader.

The B. C. Telephone Co. No. 2 are at work rebuilding and repairing their line. They will put up new poles and glass insulator.—Bacon Chapel News Shelbyville (Mo.) Herald.

The stockholders of the Tyler Telephone Co. are wearing happy smiles since receiving their annual dividend checks of 8 per cent.— Tyler (Minn.) Journal.

The Franklin County Telephone Company has just installed a pole changer, a very expensive little contrivance but it renders the switchboard work much easier. Instead of turning a crank the operators now press a button.—Charleston Item, Ft. Worth (Tex.) Record.

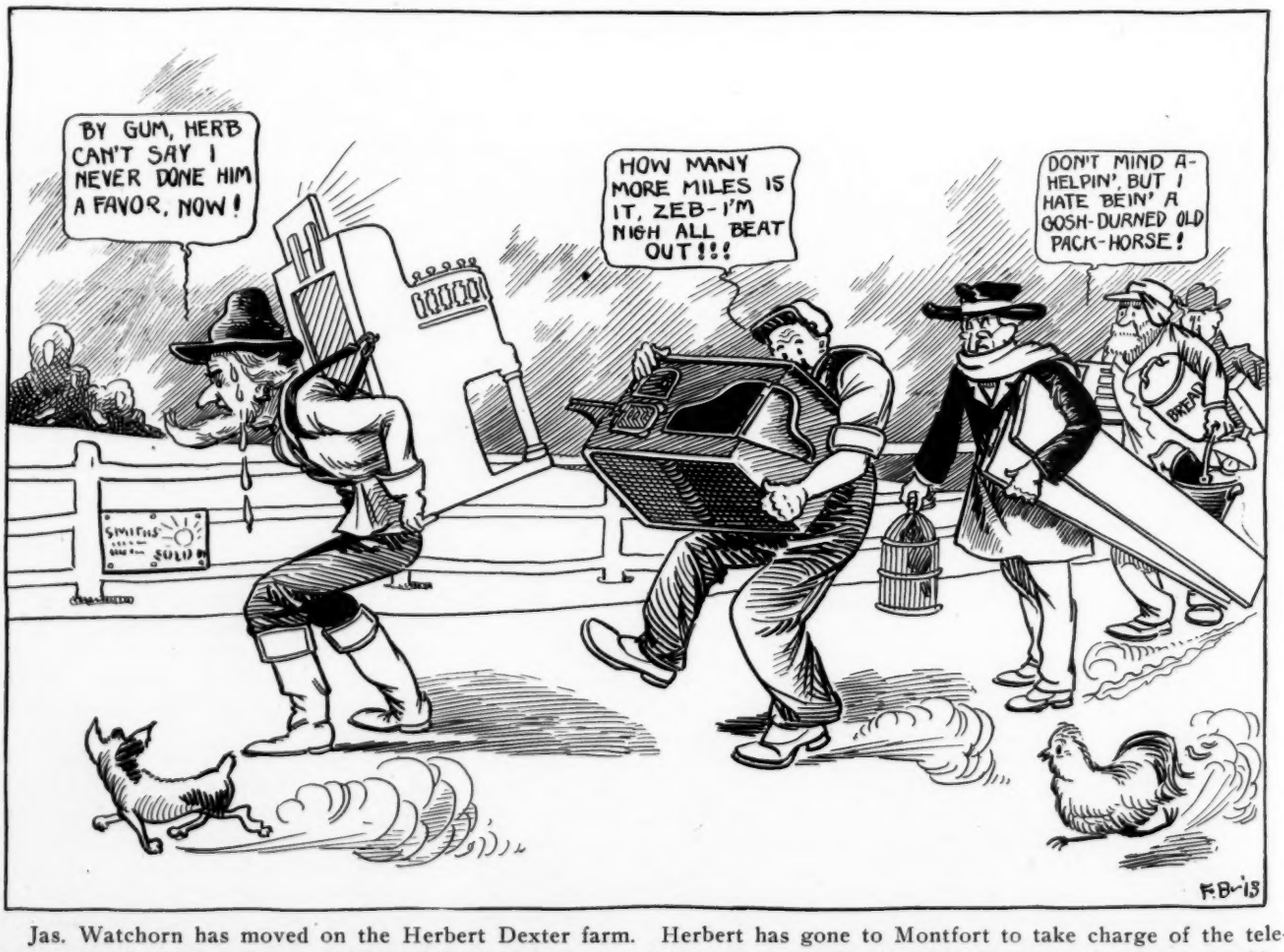
Mrs. Mary Williams of Stockdale has purchased the local telephone exchange.—Berclair Item, Galveston (Tex.) News.

Our 'phone line is completed and people in this neighborhood are able to talk to Milan and other important places.—Broken Bridge News, Milan (Mo.) Standard.

At a meeting of stockholders of the Mill Creek Telephone line held Tuesday at the home of Henry Stecker, it was voted to improve the line by making it a metallic circuit. The line has 13 subscribers and is five miles in length.—Marshfield (Wis.) Herald.

The barb-wire telephone plant is giving excellent service. Mr. Townsend, the manager, received two new instruments this week, installing one in the college. The line will be extended west soon.—Jireh Item, Van Tassel (Wyo.) Pioneer.

Philip Westrick is building a short local telephone line which will be connected to one of the lines going to St. Clair.—Belle River Mills Item, Marine City (Mich.) News.


BY GUM, HERB CAN'T SAY I NEVER DONE HIM A FAVOR, NOW!
HOW MANY MORE MILES IS IT, ZEB- I'M NIGH ALL BEAT OUT!!!
DON'T MIND A-HELPIN', BUT I HATE BEIN' A GOSH-DURNED OLD PACK-HORSE!
BREAD
F.B.-13

Jas. Watchorn has moved on the Herbert Dexter farm. Herbert has gone to Montfort to take charge of the telephone central. Many of the neighbors helped him move, not because they wanted to get rid of him, but they loved him. Sorry to see him go. His sale was a success.—Brenton Item, Fennimore (Wis.) Times.

Bankers' Interest in Wisconsin Public Utilities Act

Manager of Bond Department, Marshall & Ilsley Bank, Milwaukee, in Paper Read at Recent Convention of Wisconsin Telephone Association, Endorses Law and Declares It Makes for Stability of Investment—Says Utility Bonds Steadily Winning Favor

By H. J. Dreher

What I have to say is my sincere conviction based upon a careful study of the public utilities law and daily enforced by the peculiar duties of the department of banking activity which I direct.

I am fully aware that many diverse opinions exist, not only as to the enforcement of the law but even as to its substance, and that in many minds even after the lapse of the time in which it has been in force, there still exists an honest doubt as to its benefit and expediency. But I believe that all men sentient to the trend of public opinion now admit that one great era in the development of state and nation has passed away forever and that another has been completely substituted therefor.

If any word may describe the present era it is democracy. I need not call to your minds the varied forms in which democracy has recently expressed itself in statute law and in the minds and consciences of men, for the strenuous political activities of the past 10 or 12 years vividly explain to you my meaning. But it was inevitable that a movement so fundamental and receiving so much of its impetus from the abuses, real or fancied, of corporate activity, should do much to directly affect those objects of criticism.

Democracy has expressed itself in the field of finance and public utility activity in the form of regulation. The banks of the state and nation for many years past have been under the rules of such regulation and its extension to other fields of endeavor was not an act of unusual concern.

Growth of Belief in Utility Control.

From the period of the Granger legislation in the early 70's, when Justice David Davis, of Illinois, in a memorable decision, in substance, held that the legislative exercise of rate making power came within the constitutional power of legislatures, to the period commencing in 1896, of marvelous commercial and industrial development, thinking men have been endeavoring to place upon statute books legislation which would in no manner curtail, or repress, the legitimate activities of railroads in the extension and development of their functions, and yet would insure control to the people, within proper spheres, of the highways of commerce, and equal treatment to all in their use.

The early legislation aimed solely at the correction of the abuses arising from discriminatory rates and rebates. But it was inevitable, with the great publicity attendant upon this agitation, that a wider and keener interest should be aroused among men regarding all public service corporations. If the regulation of railroads was a proper function of the state, why not also street railways, gas and electric companies, and telephone companies, all rendering essential service and each having in degree, similar functions? And so, from the crystallization of this sentiment, there evolved a public service law in this state, which has served since its enactment as a model for many others.

In the determination of the value of such a law, four distinct fields of interest must be considered: The promoter, the public, the corporation and the investor.

It is natural and legitimate that he who conceives and carries to completion in the face of many obstacles and after bearing the many burdens and risks inevitable to new enterprises, should feel that the child of his brain and labor should yield to him adequate return in reward. I believe it should. But the definition of the term "adequate" will be the rock upon which opinions will break, for conflict is inevitable.

If it be true that, as a general rule, the era of large profits in the field of promotion of new enterprises impressed with public service is past, then it must be conceded also, that the satisfaction for achievement will be a smaller margin of profit, but a more secure and permanent enjoyment of the completed property, or its reasonable equivalent in money value.

Advantages Under Wisconsin Law.

Our public utilities act affords this security. By its provisions, and the property laws of the state, public utility properties enjoy, when furnishing adequate facilities, practically unlimited existence. If, however, a municipality should exercise its power to acquire an essential public utility, then the procedure must be fair, and adequate compensation must be paid in return. More than this cannot be asked, particularly as the law now provides that all corporations organized since its passage shall be subject to its provisions.

As to the public, it seems to me that, viewed from every point, the act is purely beneficial. I need not mention the elimination of discrimination, the increased efficiency of service, the more adequate conception of a community's needs, or the fixing of a reasonable charge for service, to justify its existence. Anyone of those benefits derived does that more effectively.

A careful study of the enforcement of the law as it directly affects the public utility corporation in its operation is very interesting and extremely valuable. In the state of Wisconsin, with a population of approximately 2,300,000, but 752,000 people live in cities of 10,000 population or over. When you consider that this includes Milwaukee, with nearly 400,000 people, it may be seen that the greater part of our population is without the limits of large cities.

The significance of this fact is at once apparent. By far the larger number of public utility corporations serving this population operate in small communities where earnings do not warrant the expenditure of large sums of money for expert employes. Therefore, it logically follows that most of these plants are operated with varying degrees of efficiency by local men. No matter how conscientious managers may be, without efficient methods of operation and accounting the highest development of a plant cannot be reached.

By the suggestions given, and by the systems of accounting installed by the Railroad Commission under the authority granted by the uniform accounting provision of the act, changes have been effected which have revolutionized methods of both management and accounting and have been of inestimable benefit to stockholders, and to citizens dependent for efficient service upon managerial methods of operation and development. As one of the important essentials of business success is efficiency in method, many pub-

lic utilities owe their development upon a sound basis to the inception and enforcement of this law.

How Investing Public is Affected.

Outside of the public, as consumers of public utility service and direct beneficiaries of efficient or inefficient service, there is, if I may use the somewhat imaginative expression, another public with different interests and with keener susceptibilities. Though part of the same great public first mentioned, they are nevertheless to all intents and purposes apart, as they are touched by different interests more personal in nature and therefore more vital. I refer to the investors.

The amount of capital obligations—stocks and bonds—annually offered for absorption has long since passed the billion mark. Of this vast amount the proportion of public utility securities is annually growing larger. We have seen the 3 per cent. railroad bond, the prime security of years past, increase its interest rate by half per-cents. until today, the approximate interest rate is 4½ per cent. with an average income yield close to 5 per cent.

We have seen the public utility bond, with great opposition, fight for a market, for a price, and for ready absorption, and have come to realize that, today, it is perhaps the most attractive form of bond investment, having behind it the ample security of a property rendering an essential service in a growing community, and yielding to the investor the most attractive interest return, consistent with conservative security, upon the market. The period of greatest development in the flotation of public utility securities has been the past six or seven years; the greatest incentive thereto has been the enactment of sound public utility regulation laws.

Effect of Act on Public Utilities.

To be specific then, how has the Wisconsin public utility act affected the Wisconsin public utility corporations in the pursuit of a sound financial policy to provide for development?

First, it has remedied a franchise situation which gave promise of curtailing legitimate and necessary financial undertakings. The term franchise has been for many years and in many ways a source of trouble. It has corrupted politics and cities and, when gained, has been of small permanent value to far-seeing utility managers planning for future needs and development. Through the indeterminate franchise, long term bonds hitherto unavailable by reason of franchises expiring before maturity, can now be issued, and extensions or betterments not immediately productive of income and yet capable of great future value to both company and community are made available.

Second, it has eliminated what is ordinarily termed cut-throat competition. In one of its sections the act provides that necessity must be shown for the establishment of a competing utility.

This means, briefly, that, where funds have been invested in the securities of a public service corporation rendering service in a small community and earning sufficient to adequately carry maintenance, interest, and dividend charges through the advanced and wise provision of this act, the bond holder is protected in his investment as never before.

Third, it has furnished a just, adequate and reasonable basis for the issuance of bonds necessary for financing purposes. In this it has performed a tremendous service, for it has affected thousands of people whose only interest in a public utility corporation is in the stability of its bonded obligations.

Bonds based upon earning power, though reasonably safe, can never equal in security those whose desirability is based primarily upon the basis of physical valuation plus earning power. By the provisions of the act an issue of bonds, before being marketed, must be authorized by the commission. An act precedent to such authorization is the placing upon the property of present physical value which means not book value nor original cost, but present depreciated value, which is the only sound basis of valuation.

The banking power of this nation in the past 10 years has become the most potent single factor of strength and power in it. Every new enterprise conceived, every railroad projected and operated, every industry which builds up its tremendous organization, must of necessity enter into relation with the banker. From him the capital which inaugurates an enterprise is obtained, through him its development is financed and to him will ultimately come the burden of loss should the project prove unsuccessful.

The Banks an Important Factor.

It is highly important to the banker that all who desire should have an opportunity to operate in the world of commerce, and, in the construction of business enterprise, create more and more wealth. Wealth is the basis of credit and credit is the foundation stone of business.

The banker also has another responsibility of greater importance than any other and that is to safeguard without loss, the tremendous wealth entrusted to his care. These deposits must earn and must be so placed that the principal shall ever be safe. Clients must be advised as to safe investments and the investment of funds in enterprises rendering essential service to the community must also be fostered in order that no legitimate enterprise may ever be curtailed from development through lack of necessary funds.

Your business, gentlemen, is to bring instant communication to the world of business. The wonders you have worked read like the pages of some ancient romance. The service you have rendered to mankind is inestimable. In efficiency, in largeness of vision, in a desire for greater achievements, you are entitled to the utmost credit. You have become a great social force working for intelligence, development and progress.

The banker of the nation, at least he of the generation now entering upon the stage of activity, feels and throbs with you. He sees the marvels of modern life. He seeks to extend the field of activity in every direction. Every proposition of merit he wants to aid. Every great project conceived in a spirit which makes for the greater power and glory of America he wants to finance.

Out of conflict has come the great forward strides of history. Conflict is the great progenitor of permanent achievement. Out of many minds, after much discussion, came the public utility act, of Wisconsin. Its merits are many; its demerits few. It will need revision and change from time to time as new conditions arise, as from great intensity emerges greater complexity. But it can be changed whenever necessary.

In the banking profession we are concerned with the upbuilding of wealth and prosperity. Any step forward is worth endorsing. Principles, sound in fundamental conception, are embodied in the Wisconsin public utility act. It has meant much to this state. It will mean more as time goes by. It has given to one branch of finance a position of stability hitherto unknown. I am glad, indeed, to raise my voice in endorsement of its merit, its equity, and the largeness of wisdom and efficient service which has made it the great factor for good it now is, not only in this state, but throughout the other states of our country.

This paper has been prepared in pamphlet form by the Wisconsin State Telephone Association. Copies may be obtained by addressing the secretary, P. J. Weirich, Monroe, Wis.

From Factory and Salesroom

Convention: Association of Railway Telegraph Superintendents, St. Louis, Mo., May 20-23

Sumter-Dean Telephones for the South.

The Sumter Telephone Mfg. Co., Sumter, S. C., announces that it has turned over the business of its telephone department to the Sumter Telephone Supply Co., a corporation which will also represent the Dean Electric Co., Elyria, Ohio, thus forming a combination of the well known Sumter-Dean lines.

The new Sumter-Dean line will embrace everything necessary for the large and small exchange, from multiple switchboards to construction material, and particularly farm line telephones and small boards especially suited to meet southern operating conditions.

This complete line will embody the experience of skilled engineers and is especially suited for use in conjunction with either the Sumter or Dean apparatus.

An immense stock of apparatus and supplies will be located at Sumter, and with factory stocks to draw from, shipments will be made practically the same day orders are received. There are seven railroads running out of Sumter, which makes it a splendid distribution centre for the southern states.

The advent of the Sumter Telephone Supply Co. will be welcomed by southern Independents, as it will be the only Independent concern in the South. The apparatus should be especially worthy of consideration, since it is backed by the reputation and skill of two of the oldest and largest Independent manufacturing concerns.

The formation of this new company in no way affects the existence of the Sumter and Dean companies. The Sumter Telephone Mfg. Co. is enlarging its facilities, but will confine itself to the production of ignition apparatus. The Dean company will continue the manufacture of its regular line as heretofore and in addition will furnish the Sumter-Dean apparatus for the Sumter Telephone Supply Co., and renewal parts for the switchboard apparatus as heretofore made by the Sumter Telephone Mfg. Co.

A prosperous future is predicted for the Supply company, which is now in position to fill orders promptly.

A Cracraft, Leich Installation in Ohio.

The Cracraft, Leich Electric Co., of Genoa, Ill., has just completed the installation of a three-section common battery multiple switchboard for the Union County Telephone Co. at Marysville, Ohio. The board has an ultimate capacity for 2,400 lines and is equipped for the immediate operation of 600 common battery lines and 100 toll and farmer lines. It is equipped with four-party synchromonic ringing. All auxiliary equipments such as wire chief's and chief operator's desks, are provided, making the exchange one of the most complete and up to date in that section of the state.

The installation was carried on in such a manner that the operation of the seven-position magneto transfer switchboard located in the same room was not interfered with and the company's subscribers were not without service at any time.

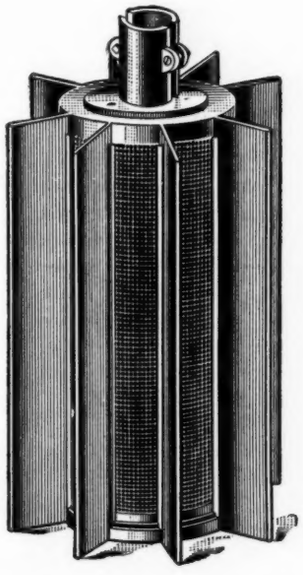
The entire work was under the personal supervision of the Cracraft, Leich company's sales engineer, H. W. Lucia.

The Evening Tribune of Marysville has the following to say regarding this installation:

"The Union County Telephone Co. is to be congratulated and commended for its enterprise in making this improvement. Beginning the first of May the Bell exchange will cease to operate locally in Marysville and its toll business from this point will be handled by the Union County Telephone Co."

The "Maxum" Grounding Box.

Grounding boxes of the type shown in the accompanying illustration are said to have been in use and on test for over five years by one of the largest companies in the field, and after this period of service to be in excellent condition and



"Maxum" Grounding Box.

giving a perfect ground. The box was designed by practical engineers to meet the requirements of electric light and telephone service and the test records appear to have established the fact that the device is built according to correct principles.

This grounding box consists of a hollow cylindrical cast iron shell approximately 5 ins. in diameter and 12 ins. long. The radial ribs which extend from the circumference of the cylindrical surface constitute a part of the same casting. The center of the box serves as a receptacle for a highly hygroscopic compound composed of silicates, sodium, carbon and vegetable fibre. In addition to drawing and retaining the moisture in the essential degree, this compound, it is said, supplies the strata of earth surrounding the outer surface with moisture and the chemicals most needed to support the electrolytic conduction upon which the transfer of current principally depends, thus readily solving the problem of resistance in keeping with the conclusion from practical tests that all resistance to current flow from an electrical conductor to the surrounding earth lies within a few inches of the grounding device.

The area of contact surface of this ground is over 500 sq. ins., a fact which reduces the current density per unit area for any given discharge to a very small amount, thus preventing the heating effect from becoming great enough to rapidly drive off the electrolytic moisture that supports conduction. Tests made with this grounding box are said to have shown a very high ampere-hour capacity even under heavy discharge rates, without apparent increase in resistance due to local heating.

In designing this grounding box the use of copper and solder have been avoided in order that there might not be present the elements of a battery which would support electrolytic action and cause a rapid deterioration of the metal parts.

Connection to the ground box is by means of a one-inch galvanized iron pipe that is screwed into the top of the casting

and fastened by means of a clamping lug. To eliminate possible corrosion the entire construction is heavily galvanized by the hot dip process.

The grounding box is installed by sinking it to a depth of 5 or 6 ft., preferably in moist, loamy soil, and having a connecting pipe long enough to bring the end 12 ins. or more above the grade level. Connection between the pipe and the circuit or apparatus to be grounded is made by means of a ground clamp. In large installations of electrical apparatus where a heavy ground connection is desired, several of these ground boxes may be installed five feet or more apart and connected together by a common grounding bus. The "Maxum" grounding box, as this device is named, is manufactured by the Fairmount Electric & Mfg. Co., of Philadelphia, Pa.

The Mine Telephone.

By Berton Braley.

"Ting-a-ling-a-ling" you can hear my noisy ring
As it echoes in the chambers of the mine,
When I clearly come across with the orders of the boss
Which are ripping in a volley down my line,
Though for miles the workings run I have hitched 'em up as one,
I have made the mine a unit by my call,
From the busy bottom pump to the breaker and the dump
I'm the blooming nervous system of it all!

"Ting-a-ling-a-ling" hear the message that I fling,
"There's a cave in Number 20, send a crew,"
So they listen to my shout and they come and dig us out
While without me 'twould be hours before they knew.
On my slender singing wire thrills the warning of the fire,
I give notice of the vapor's deadly breath,
And again and yet again I have saved the lives of men
Who would otherwise have faced a fearful death.

"Ting-a-ling-a-ling" you can hear my noisy ring
With its tinntinnabulation on the ear,
I'm the terror of the shirk as I drive him on to work
But when danger comes he's thankful I am here,
I'm the foe of all delay and I help to "make her pay"
As a master of efficiency I shine,
From the collar to the sump I can keep 'em "on the hump"
I'm the blooming nervous system of the mine!

The exclusive right to reprint the foregoing verses on "The Mine Telephone," by Berton Braley has been secured by the Stromberg-Carlson Telephone Mfg. Co., from Coal Age in which the verses appeared.

Switchboards for Army Service.

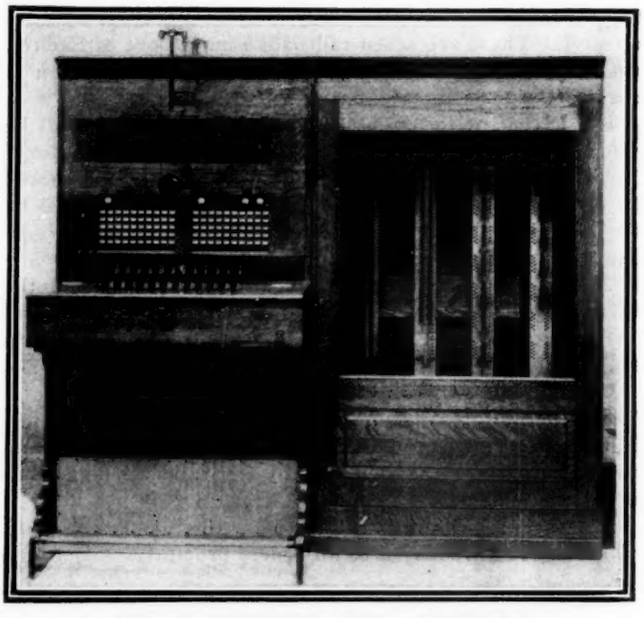
The telephone plays a highly important part in the elaborate system of our national defenses, both on shore and afloat, in times of peace as well as of war. Each department of the federal government has designed and adopted a line of telephonic equipment peculiar to itself to meet the requirements most efficiently.

The accompanying illustration shows one of seven common battery visual signal switchboards with the associated arrester cabinet recently delivered by the Stromberg-Carlson Telephone Mfg. Co. to the United States Signal Corps at Forts Wood and Omaha. One of the prominent features of this apparatus that impresses the observer instantly is the massive and rigid design of the cabinet work. This is principally due to the fact that the equipment is subject to many severe service conditions including the blast of heavy gunfire. The woodwork is of oak with light pleasing finish, which does not show the effects of ordinary wear.

Switchboards of this type are usually furnished in 55 and 110 line units, the particular one shown being fully equipped to its capacity of 100 common battery and 10 magneto line equipments. The common battery line equipments consist of the Stromberg company's standard No. 14-A visual signal with answering jack of the double cut-off type. These are designed to operate from a storage battery having a potential of thirty volts, a feature not usually encountered in commercial practice. One line is fitted with a test circuit so that the operator can quickly determine if there is sufficient energy available to properly operate the switchboard.

The cord circuits, of which 12 are furnished, are of the double lamp supervisory type employing relays of two windings each, which, in addition to their usual function of controlling the cord disconnect lamps, are a means of supplying talking battery to the connected lines. This eliminates the necessity of special impedance or repeating coils in the cord circuit and greatly simplifies the circuit wiring. The cord equipments also include the usual complement of double ringing and listening keys, etc.

Arrester cabinets of proper capacity are furnished with each section of switchboard and intended to line up with the



A Common Battery Visual Signal Switchboard.

switchboard cabinet when installed. Plate glass doors afford ready access to the arrester equipment, which includes standard carbon block and heat coil protectors, together with terminals arranged for cross connecting.

The delivery of this equipment exemplifies the ability of the Stromberg-Carlson company to furnish "telephones for any kind of service."

Paragraphs.

Oshkosh Mfg. Co., Oshkosh, Wis., has issued a new 32-page catalogue covering electrical tools, construction tools, devices and specialties. This is designated catalogue No. 35 and may be obtained by those interested.

The Electric Economy Co., which manufactures a complete line of bell ringing transformers, rectifier sets for charging storage batteries and Brown bell ringers for direct current systems, has removed its factory to Hyde Park, Mass., where it will have better facilities to meet the ever increasing demand for its products. Bulletins containing descriptions and prices of the company's products will be gladly sent upon request.

Waste That Might Be Avoided in Anchoring Poles.

The accompanying photographs taken alongside the Milwaukee depot at La Crosse, Wis., show a very interesting bit of pole anchorage, the interesting part being the waste of money and material involved. The installation was evidently made

An Expensive Method of Anchoring.

in total disregard of the cost. When installed the anchors shown in the picture were capable of holding approximately 100,000 lbs., which was six times the required amount. Close observation reveals three anchor rods in front of the pole, and two anchor rods to the right of the pole, as well as one stump. These anchors carry a total of seven twisted steel cables, each one equipped with a turn buckle. The estimated cost of the anchorage installed and including material and labor was $52.50.

The three rods in the foreground, as well as those to the right of the pole are fastened to an eight foot log buried horizontally six feet deep. The stub shown at the right of

Lead Held by Five Anchors and One Stump.

the picture has a similar slug bolted to it. All three cables in the foreground are slack and in fact it can be seen how the wind moved the one on the extreme left while the picture was being taken. This particular installation has received considerable comment and was brought to our attention for further discussion.

A telephone engineer was asked for an expression as to the anchorage he would recommend for such requirements. His answer was, one No. 2 Drive and Twist Anchor to the right of the pole and as close to the fence as possible, this anchor to be equipped with 3-8 in. cable, but no turn buckle; also two No. 3 anchors in front of the pole, one of them to be close to the fence and the other close to the brick walk, these two anchors to be equipped with 7-16 in. cables and turn buckles. The total cost of this anchorage would then be $10.25. This would represent a saving of $42.25 as compared with the anchors shown in the illustration.

C. R. Pieper, Sales Manager,
La Crosse, Wis. The Vote Berger Co.

A. B. Crawford Back with Stromberg-Carlson.

A. B. Crawford, for years Stromberg-Carlson's representative in Ohio and West Virginia, joined the Western Electric Company's staff in December, 1912, but is now back with his former employer and actively engaged in sales work in Ohio working with E. J. Dean, also of the Stromberg-Carlson company. Mr. Crawford is an Independent telephone man of wide experience and ability and has been successful in making

A. B. Crawford.

"Quality Apparatus" known throughout the big territory he covers. The company is pleased to advise its customers of this addition to its staff and intends to give them the best service through Mr. Crawford's efforts. For the present his address is No. 19 North Seventh street, Hamilton, Ohio, and all inquiries addressed to him there will receive prompt attention.

British Government Orders New Automatic Exchange.

An order for a 2,000-line initial equipment for the exchange at Newport, England, has just been placed with the Automatic Electric Co., of Chicago, through the Automatic Telephone Mfg. Co., Ltd., of London, owners of the automatic patent rights in Great Britain.

This is the fourth automatic exchange to be ordered by the British government, the general post office having 500-line plants in operation at London and Epsom, while a 6,800-line equipment for Leeds is in course of construction.

The experts of the British Post Office department, which has charge of the telephones in that country, have conducted a thorough investigation of the automatic system and this last order is one more step in a comprehensive plan of automatic installation which was adopted, it is said, as the result of the remarkable record for reliability and efficiency made by the automatic apparatus.

Overland Touring Car Used as Power Plant.

During the recent flood in the Shenango Valley in Pennsylvania, the Union Telephone Co. maintained its service in New Castle by the use of a four cylinder motor from an Overland touring car.

Some Cable Construction Accessories.

An easily adjustable, one-piece type of guy clamp that under a tensile strength test has held a seven strand crucible steel guy rope to the breaking point of the rope is shown in the

Assembled Parts of B & K Guy Anchor.

accompanying illustrations. It is unnecessary to take the clamp apart to use it. The rope is merely placed in the recesses of the pressed steel portion, the bolts turned transversely and the nuts made up. It is claimed that this gives a powerful, unyielding hold. The danger of stripping the bolt threads is eliminated by using a more substantial bolt than is ordinarily used in guy clamps.

This clamp is known as the B. & K. clamp and is manufactured by the Barnes & Kobert Mfg. Co., New Haven, Conn. The case portion of this clamp is made from drawn steel of a sufficient gauge to retain its shape when the breaking point of the rope is reached on a direct pull. The bridge is electrically welded, making a one-piece clamp that is declared to be practically indestructable.

In the test of this guy clamp, which has been referred to, the seven strand crucible steel guy rope used was listed as having a tensile strength of 10,000 lbs. A Riehle tensile strength testing machine was used and the registered strain when the rope broke was 15,260 lbs. An examination showed that the guy clamp had not injured any portion of the strand and the clamp was still in a very serviceable condition.

The B. & K. guy clamp is not only an efficient clamping device for wire guy rope but it will be noted that its construction

Guy Clamp Installed. Guy Clamp After Test.

is such as to reduce its cost, while the fact that it can be easily adjusted means a saving of the lineman's time.

The manufacturers of the foregoing guy clamp also make the B. & K. mushroom guy anchor shown in the accompanying illustrations. This anchor is built in four sections and may be installed either as a half section, three quarters section or as a complete disc. The diameter of the complete disc is 20 inches. The sectional members overlap each other at the hub giving to that part a thickness of over three-fourths of an inch of metal. The anchors are quickly and easily put into position and in handling and shipping have a number of obvious advantages over creosoted blocks and wood logs. The B. & K. anchor complete weighs 13 lbs.

The pressed steel B. & K. cable bracket is another product. The channel iron of this device is T-slotted, the slots being placed on 1½ in. centers. The brackets are made with a long tapering rib and a short heel, the latter being electrically welded in place, thus making practically a one piece bracket. This gives a rigid and strong construction and it is claimed that one of the 10-inch brackets will easily sustain 200 lbs. weight at the extreme end. This provides a bracket which not only carries the load required of it but which is safe for an employe to bear his weight on when emerging from a manhole. The

Mushroom Guy Anchor Complete and Crated for Shipment.

purpose of an offset at the lower end of the channel rack is to permit an extension to be added if desired without discarding the original rack.

Biographical Poem From Webster City.

The "Hoo's Hoo Hereabouts" column of the Webster City Journal, of Webster City, Iowa, the home of E. H. Martin, president of the E. H. Martin Telephone Co., recently contained the following interesting production:

Who started life a plasterer
With a bunch of bonehead guys
And never dreamed some day he'd be
A magnate, rich and wise?

Who used to man a freight train wild
In Mizzo, down 'round St. Joe,
And then began a pounding keys
Because it brought more dough?

Who started in the telephone biz
On a capital of nerve,
And worked and sweat and worked some more
The people for to serve?

Who is it is some wizard man
At juggling with the cash,
And nothing that he tackles
Ever goes ker plunk to smash?

Who is the guy whose motto is
This sentiment, "I can,"
Nor gives a d—— what others think?
That Eddie Martin man.

Legal Cases and Decisions

By A. H McMillan

Telephone Service as a Commodity of Commerce.

One telephone company brought suit against another for the specific performance of a contract for the sale of certain telephone lines and to enjoin the violation of the agreement.

The plaintiff operated several rural lines radiating from the city of Cumberland, Wisconsin. The defendant company operated similar lines and in addition furnished telephone service in that city. Prior to May, 1909, some of the rural lines of the parties were parallel and served the same territory. The plaintiff company was contemplating the installation of an exchange to furnish telephone service to Cumberland, in competition with the defendant.

To comply with the wishes of the merchants and business men of the city who desired to secure telephone connection with all the corporations of both companies by single telephones in each business place, and who were willing to secure a reduction in the cost of telephone service to them by an increased rate for the single telephone, the contract in question was executed. The increased rate, however, was to be less than the combined rates for telephones from both companies.

The contract provided that it should take effect after the state railroad commission had consented to the proposed raising of rates. Upon this consent being given, the plaintiff company was deemed to have purchased from the defendant company those rural telephone lines belonging to the defendant which were parallel to lines of the plaintiff, and was to have the option to purchase the other rural lines. The plaintiff company was to refrain from furnishing telephone service in the city to residents except as to one telephone already installed and each company for seven years was to furnish free connection to the patrons of the other. The defendant company was to erect no rural lines and was not to increase beyond 25 the number of telephones on any of the existing rural lines maintained by it.

The complaint alleged that the conditions of the contract had been complied with by the plaintiff company, but that the defendant company, contrary to the provisions of the contract, had extended its lines outside the city, had added new lines to its rural system in violation of the conditions of the contract, and had refused to comply with the option given by it to the plaintiff company for the purchase of the defendant's remaining rural lines.

In view of the public utilities law empowering the state railroad commission to prevent exorbitant charges, the contract was held not to "restrain or prevent competition" within the laws of the state, which provide that any corporation, which shall enter into any combination, conspiracy, trust, pool, agreement or contract intended to restrain and prevent competition in the supply or price of any article or commodity in general use, shall have its charter cancelled. In interpreting the law, the court classed telephone service within the general terms of the statute, as a commodity constituting a subject of commerce.

The court also held that the complainant company was entitled to enforce the specific performance of the agreement to sell the rural lines, there being no adequate remedy at law. McKinley Telephone Co. vs. Cumberland Telephone & Telegraph Co., 140 Northwestern, 38.

Is a Rural Company a Public Service Corporation?

Several farmers associated together for the purpose of establishing and constructing a rural telephone line from the village to their homes. They formed a corporation under chapter 58 of the laws of 1905 for Minnesota. The company was not incorporated for pecuniary profit but simply for the benefit of the members. The original members were required to pay $50 for their system and later an additional amount of $10 was received. The admission of new members was provided for, each being required to pay $50 for his stock. Two other persons sought to become members and offered to comply with the rules and regulations of the company.

The system was divided into a number of branches called "Line 1," "Line 2," etc. These persons demanded to be connected with "Line 1." This was refused, but the company offered to connect them with "Line 2." Claiming that they had been wrongfully refused, the persons brought suit to compel connection. The court did not decide whether the company was a public service corporation, saying that it was unnecessary to do so, because, conceding it so to be, the persons desiring membership, had not shown that they were refused either arbitrarily or unjustly.

The company showed that all the telephones which could be given service were already connected with "Line 1," and that the parties did not seek and were not refused connection with "Line 2." State vs. Hawk Creek Telephone Co., 139 Northwestern, 711.

Contract for Rates.

The rates for telephone charges were provided in an ordinance adopted and accepted in the year 1900 and agreed to by an assignee of the privileges granted by such ordinance in the year 1905, as a condition of the municipal consent to the transfer, such consent being necessary under the terms of the ordinance. The resolution and the consent to the transfer to the new company, provided that, in consideration of the payment of certain arrearages of 2 per cent of gross receipts due the city from the old company and certain additional services, the city would receipt to the manager of the company for the 2 per cent referred to from year to year, "so long as he shall remain manager and said company makes no attempt to change the present rates for service".

By the laws of the state, cities of the second class were given the control of streets and alleys and it was provided that before any one should enter upon them to construct a telephone system, the right to do so must be obtained by franchise. Under these circumstances it was held that the rates fixed in the ordinance should remain in force until action was taken by the state, or by its authorities.

The mayor and council of cities of the second class were held to have no authority to contract for rates for a term of years for telephone service to be furnished the inhabitants of the city after the state by direct legislation, or through a commission, or other lawfully delegated authority, had acted on the subject. In this particular case the telephone company was held estopped to claim that its contract with the city was beyond the powers of the municipal corporation. City of Emporia vs. Emporia Telephone Co., 129 Pacific, 187.

Plant Your Poles Deep.

If a telephone company erects a telephone pole and negligently does not set it deep enough in the ground, and by reason thereof one of its linemen, engaged in stretching wires upon it, in the exercise of ordinary care, and without knowledge or opportunity from the company to know of the improper construction, is injured by the falling of the pole, he may recover damages from the company. Thus the supreme court of Georgia declared in a recent case.

The fact that the pole was purchased or acquired by one telephone company from another does not deprive the lineman of his damages unless the defects in the poles were latent, and could not have been discovered by the purchaser in the exercise of ordinary and reasonable care. It was also held that the rule of the company requiring the lineman to inspect poles before climbing them would not necessarily debar the lineman from recovering his damages. Southern Bell Telephone & Telegraph Co. vs. Covington, 77 Southeastern, 382.

Wearing Rubber Gloves in Handling Wires.

An electric light wire splicer met his death by taking hold of an uninsulated telephone wire which had fallen across a heavily charged electric cable. For his death an action was brought, in which the judge laid down as law for the jury, that if they believed the wearing of rubber gloves and boots would have been a reasonable precaution for the splicer to have taken for his safety, and that, knowing the peril of working without them, he took hold of the wire without such precaution, the jury should find for the company.

This instruction was held proper. The verdict for the company was upheld. Jeffrey vs. Union Electric Light & Power Co., 153 Southwestern, 498.

and fastened by means of a clamping lug. To eliminate possible corrosion the entire construction is heavily galvanized by the hot dip process.

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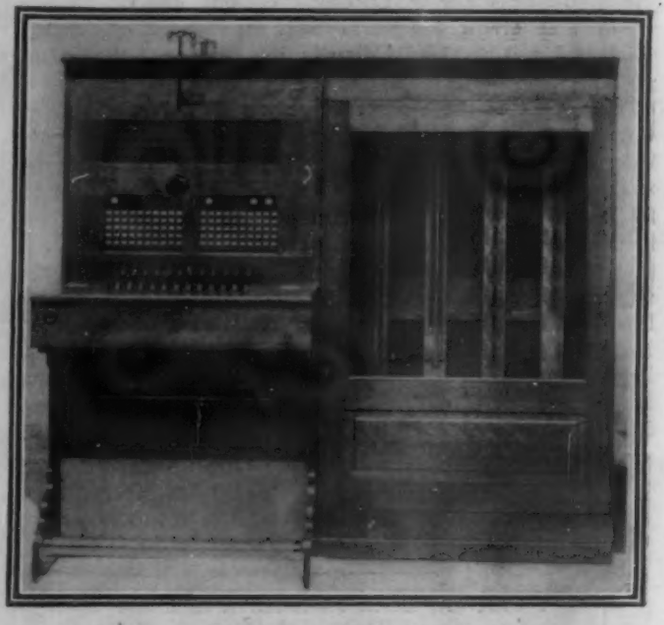

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Paragraphs.

Oshkosh Mfg. Co., Oshkosh, Wis., has issued a new 32-page catalogue covering electrical tools, construction tools, devices and specialties. This is designated catalogue No. 35 and may be obtained by those interested.

The Electric Economy Co., which manufactures a complete line of bell ringing transformers, rectifier sets for charging storage batteries and Brown bell ringers for direct current systems, has removed its factory to Hyde Park, Mass., where it will have better facilities to meet the ever increasing demand for its products. Bulletins containing descriptions and prices of the company's products will be gladly sent upon request.

Idaho Red Cedar **Poles**

Sandpoint Lumber & Pole Co., Ltd.

SANDPOINT, IDAHO.

Large Stocks—Prompt Shipments
Good Quality—Right Prices

NAUGLE

Pole & Tie Co.
5 South Wabash Ave.
Chicago, Illinois

The Trinity in Poles
"Service—
Price—
Quality."

POLES

Cedar

We **are now** distributors of both Western Red Cedar and Northern White Cedar Poles.

Crawford Cedar Co.
Menominee, Mich.

Poles

"FROM THE STUMP TO THE LINE"

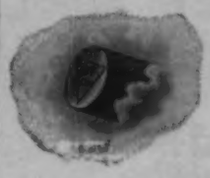
NATIONAL POLE COMPANY
ESCANABA, MICH.
CEDAR POLES

Very Few Systems Employ Flimsy Construction any more. The Better the Company, the Better its Methods. We are Able to Fill the Most Exacting Requirements of the Very Best Companies.

Over fifteen years of experience in WHITE and WESTERN CEDAR POLES
Exceptional Facilities. Yards at the Most Favorable Shipping Points.

National Pole Co., Escanaba, Mich.

Please tell the Advertiser you saw his Announcement in TELEPHONY.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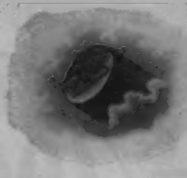
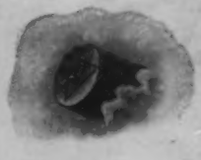


POLES

BRADLEY TIMBER
and
Railway Supply Co.
Duluth, Minn.

Write for Quotations on any Quantity

POLES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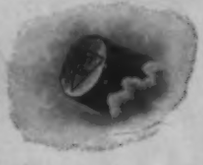


IDAHO AND NORTHERN
CEDAR POLES
WE ARE PRODUCERS
Yards in IDAHO, MICHIGAN, CANADA.
Toledo Yard for Urgent Orders. Get our Prices.
Ask for Leaflet No. Six
THE F. BISSELL COMPANY, TOLEDO, OHIO

Mr. Buyer?
Do You Realize the Importance of Buying from a Producer?
Our POLES Have Our Concentrated Attention from Stump to Car.
ONE PROFIT—ONE QUALITY—ONE PRICE
954 Security Bank Bldg., Minneapolis, Minn.
TRI-STATE CEDAR CO.
208-209 Harding Bldg. Coeur-d'-Alene, Idaho

WRITE US—WE MAKE LOW PRICES—SHIP GOOD STOCK
Idaho Red Cedar Poles
30 CEDAR YARDS IN IDAHO, WASH. AND B.C.
WESTERN LUMBER & POLE CO.
Main Office: "Electric" Bldg., Denver, Colo.

"K-H" stands for KIRBY-HAWKINS
When in the market for
CEDAR CYPRESS POLES AND CHESTNUT
remember the name.
WRITE FOR OUR QUOTATIONS
Address Kirby & Hawkins Co.
322 Arcade Bldg. Philadelphia

The Erection of Timber Preserving Plants—Creosoting or Kyanizing—is My Specialty.

I know all the problems entering into the building of such plants—have had wide experience on some large foreign installations. I can arrange plants for, Kyanizing with pressure in cylinder or without, open tank process, fluoric salts, etc.

References: Austrian and German Reichspost.

Ask for further information

Dr. Jng. Friedrich Moll

Südende bei Berlin. Brandenburgische, Strasse 4 (Germany)

Warehouse: Brookport Ill. LONG LEAF Mills: Corinth and Ripley, Miss.
YELLOW PINE CROSS ARMS
Ship in any Quantity. Standard and Special Sizes
SOUTHERN PINE MFG. CO., PADUCAH, KY.

Avenarius CARBOLINEUM REGISTERED
Most concentrated oil for brush or open tank treatment of poles and cross arms
PRESERVES WOOD EVERYWHERE
TESTED BY TIME
CARBOLINEUM WOOD PRESERVING CO.
Dept. 5, Milwaukee, Wis.

POLES OF STERLING QUALITY
Oldest Cedar Pole Firm in Business
MICHIGAN AND WESTERN CEDAR
W. C. STERLING & SON COMPANY
MONROE, MICHIGAN

The Most Satisfactory Medium in the World
—for advertising Poles, Cross Arms, Pins, Brackets, Preservatives, or any other item employed in Telephone construction work, is
TELEPHONY

The Bierce Anchor
One solid piece. Will not creep.
When the best is also the cheapest.
Where is the argument?
Let's get acquainted.
The Specialty Device Co.
CINCINNATI, OHIO

CEDAR POLES
AND CROSS ARMS
LOWEST PRICES—PROMPT SHIPMENTS
Wm. Mueller & Co., 920 Postal Telegraph Bldg.
Established 1862. - - - - CHICAGO

Please tell the Advertiser you saw his Announcement in TELEPHONY.

Waste That Might Be Avoided in Anchoring Poles.

The accompanying photographs taken alongside the Milwaukee depot at La Crosse, Wis., show a very interesting bit of pole anchorage, the interesting part being the waste of money and material involved. The installation was evidently made

An Expensive Method of Anchoring.

in total disregard of the cost. When installed the anchors shown in the picture were capable of holding approximately 100,000 lbs., which was six times the required amount. Close observation reveals three anchor rods in front of the pole, and two anchor rods to the right of the pole, as well as one stump. These anchors carry a total of seven twisted steel cables, each one equipped with a turn buckle. The estimated cost of the anchorage installed and including material and labor was $52.50.

The three rods in the foreground, as well as those to the right of the pole are fastened to an eight foot log buried horizontally six feet deep. The stub shown at the right of

Lead Held by Five Anchors and One Stump.

the picture has a similar slug bolted to it. All three cables in the foreground are slack and in fact it can be seen how the wind moved the one on the extreme left while the picture was being taken. This particular installation has received considerable comment and was brought to our attention for further discussion.

A telephone engineer was asked for an expression as to the anchorage he would recommend for such requirements. His answer was, one No. 2 Drive and Twist Anchor to the right of the pole and as close to the fence as possible, this anchor to be equipped with 3-8 in. cable, but no turn buckle; also two No. 3 anchors in front of the pole, one of them to be close to the fence and the other close to the brick walk, these two anchors to be equipped with 7-16 in. cables and turn buckles. The total cost of this anchorage would then be $10.25. This would represent a saving of $42.25 as compared with the anchors shown in the illustration.

C. R. Pieper, Sales Manager,
La Crosse, Wis. The Vote Berger Co.

A. B. Crawford Back with Stromberg-Carlson.

A. B. Crawford, for years Stromberg-Carlson's representative in Ohio and West Virginia, joined the Western Electric Company's staff in December, 1912, but is now back with his former employer and actively engaged in sales work in Ohio working with E. J. Dean, also of the Stromberg-Carlson company. Mr. Crawford is an Independent telephone man of wide experience and ability and has been successful in making

A. B. Crawford.

"Quality Apparatus" known throughout the big territory he covers. The company is pleased to advise its customers of this addition to its staff and intends to give them the best service through Mr. Crawford's efforts. For the present his address is No. 19 North Seventh street, Hamilton, Ohio, and all inquiries addressed to him there will receive prompt attention.

British Government Orders New Automatic Exchange.

An order for a 2,000-line initial equipment for the exchange at Newport, England, has just been placed with the Automatic Electric Co., of Chicago, through the Automatic Telephone Mfg. Co., Ltd., of London, owners of the automatic patent rights in Great Britain.

This is the fourth automatic exchange to be ordered by the British government, the general post office having 500-line plants in operation at London and Epsom, while a 6,800-line equipment for Leeds is in course of construction.

The experts of the British Post Office department, which has charge of the telephones in that country, have conducted a thorough investigation of the automatic system and this last order is one more step in a comprehensive plan of automatic installation which was adopted, it is said, as the result of the remarkable record for reliability and efficiency made by the automatic apparatus.

Overland Touring Car Used as Power Plant.

During the recent flood in the Shenango Valley in Pennsylvania, the Union Telephone Co. maintained its service in New Castle by the use of a four cylinder motor from an Overland touring car.

Some Cable Construction Accessories.

An easily adjustable, one-piece type of guy clamp that under a tensile strength test has held a seven strand crucible steel guy rope to the breaking point of the rope is shown in the

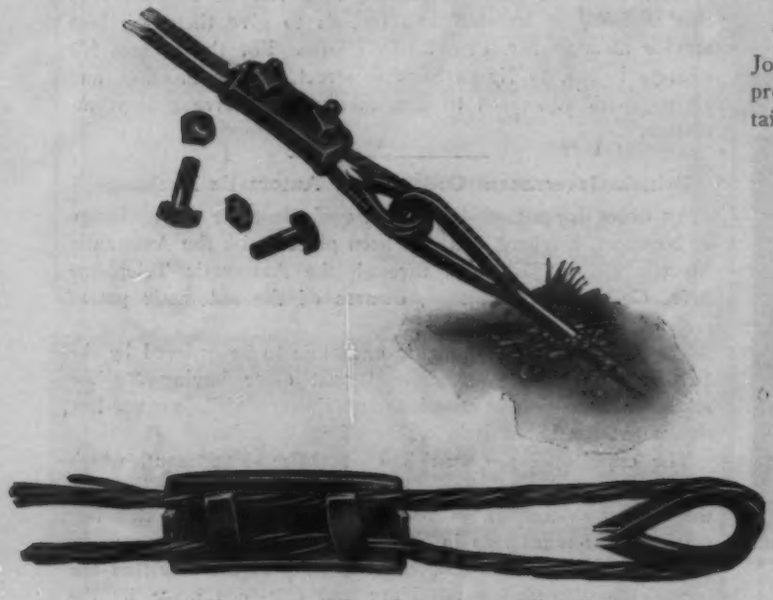
Assembled Parts of B & K Guy Anchor.

accompanying illustrations. It is unnecessary to take the clamp apart to use it. The rope is merely placed in the recesses of the pressed steel portion, the bolts turned transversely and the nuts made up. It is claimed that this gives a powerful, unyielding hold. The danger of stripping the bolt threads is eliminated by using a more substantial bolt than is ordinarily used in guy clamps.

This clamp is known as the B. & K. clamp and is manufactured by the Barnes & Kobert Mfg. Co., New Haven, Conn. The case portion of this clamp is made from drawn steel of a sufficient gauge to retain its shape when the breaking point of the rope is reached on a direct pull. The bridge is electrically welded, making a one-piece clamp that is declared to be practically indestructable.

In the test of this guy clamp, which has been referred to, the seven strand crucible steel guy rope used was listed as having a tensile strength of 10,000 lbs. A Riehle tensile strength testing machine was used and the registered strain when the rope broke was 15,260 lbs. An examination showed that the guy clamp had not injured any portion of the strand and the clamp was still in a very serviceable condition.

The B. & K. guy clamp is not only an efficient clamping device for wire guy rope but it will be noted that its construction

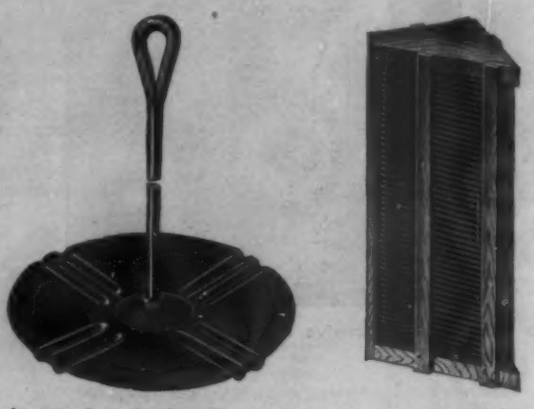


Guy Clamp Installed. Guy Clamp After Test.

is such as to reduce its cost, while the fact that it can be easily adjusted means a saving of the lineman's time.

The manufacturers of the foregoing guy clamp also make the B. & K. mushroom guy anchor shown in the accompanying illustrations. This anchor is built in four sections and may be installed either as a half section, three-quarters section or as a complete disc. The diameter of the complete disc is 20 inches. The sectional members overlap each other at the hub giving to that part a thickness of over three-fourths of an inch of metal. The anchors are quickly and easily put into position and in handling and shipping have a number of obvious advantages over creosoted blocks and wood logs. The B. & K. anchor complete weighs 13 lbs.

The pressed steel B. & K. cable bracket is another product. The channel iron of this device is T-slotted, the slots being placed on 1½ in. centers. The brackets are made with a long tapering rib and a short heel, the latter being electrically welded in place, thus making practically a one piece bracket. This gives a rigid and strong construction and it is claimed that one of the 10-inch brackets will easily sustain 200 lbs. weight at the extreme end. This provides a bracket which not only carries the load required of it but which is safe for an employe to bear his weight on when emerging from a manhole. The



Mushroom Guy Anchor Complete and Crated for Shipment.

purpose of an offset at the lower end of the channel rack is to permit an extension to be added if desired without discarding the original rack.

Biographical Poem From Webster City.

The "Hoo's Hoo Hereabouts" column of the Webster City Journal, of Webster City, Iowa, the home of E. H. Martin, president of the E. H. Martin Telephone Co., recently contained the following interesting production:

Who started life a plasterer
With a bunch of bonehead guys
And never dreamed some day he'd be
A magnate, rich and wise?

Who used to man a freight train wild
In Mizzo, down 'round St. Joe,
And then began a pounding keys
Because it brought more dough?

Who started in the telephone biz
On a capital of nerve,
And worked and sweat and worked some more
The people for to serve?

Who is it is some wizard man
At juggling with the cash,
And nothing that he tackles
Ever goes ker plunk to smash?

Who is the guy whose motto is
This sentiment, "I can,"
Nor gives a d—— what others think?
That Eddie Martin man.

AUTOMATIC
RINGING
TRANSFORMER
Automatic Transformer Co. Kansas City, Mo
Gentlemen:
We installed two years ago one of your Type S Ringing Machines, after having difficulty ringing our heavy lines, and since then we have had practically no trouble at all. One line where the first phone on it is seven miles from the office, and altogether fifteen instruments on it WE CAN RING THEM ALL, EVEN WITH FOUR OR FIVE RECEIVERS DOWN. Since we had your machine I don't think it has been readjusted more than three or four times and we are not bothered any more with sparking contacts. I recommend your machine to any company wishing to install a power which will ring when you want it to ring.
Respectfully,
THE COFFEY COUNTY TEL. CO.,
By W. Reed, Mgr.
(Waverley, Kas.)
Like Results Can Be Had in Your Exchange
If you have our catalog order a Ringing Set now. If you have no catalog write for a copy at once.
THE AUTOMATIC TRANSFORMER CO.
Ringing Equipment Specialists
407 Broadway
KANSAS CITY, MO.

"Can Ring Them All, Even with Four or Five Receivers Down"

Success Assured for the

GOTTSCHALK TRANSMITTER

WATERPROOF — SANITARY — indestructible. Transmits in natural clear voice. *No* mouthpiece, springs, small parts, exposed mechanism, changes in line or maintenance expense to contend with. Every telephone engineer who inspected it at the recent telephone convention took great interest in it.

WRITE FOR PARTICULARS

GOTTSCHALK WATERPROOF SANITARY TRANSMITTER CO.
160 Broadway - NEW YORK CITY

Gottschalk Transmitter, complete, as mounted on Instrument

Just received a message on time from

The Lafayette Electric & Mfg. Company

Through their No. 107 Type Telephone Receiver

of which we present an illustration

THIS RECEIVER is built of heavy hard rubber shell, not exposing the metal parts; self contained; imported magnet steel; silk or enamel wire coils; pressed brass cup; Japanned diaphragms; permanent adjustment.

This type of receiver cannot be effected by moisture or change in temperature.

It is sensitive, serviceable and reliable.

Manufactured and sold by

The Lafayette Electric & Manufacturing Company

Lafayette, Indiana

N. B.—

Why not drop us a postal for prices?

AMERICAN STEEL & WIRE COMPANY'S W&M TELEPHONE WIRE

OUR W. & M. Telephone Wire is drawn from metal made especially for the purpose and rigidly inspected. The spelter is carefully laid on with uniform thickness, ensuring ample protection for the wire under extreme weather conditions.

In point of conductivity this good wire has attained the highest possibilities and we submit our three brands—"E. B. B." "B. B." and "Steel" as the best that can be produced.

"W. & M. Telephone Wire News," a publication describing telephone wire in practical use, furnished free upon application.

Chicago Worcester New York Pittsburgh Cleveland Denver

United States Steel Products Company:
San Francisco Los Angeles Portland Seattle

***Stronger, More Permanent Than the Line Itself* is the Splice Made With**

NATIONAL

Double Tube

Wire Connectors

When twisted the sleeves are drawn so tightly around the wires that practically a welded joint is produced. *Solder unnecessary* with a National splice.

It is the better way to repair a line—and the best way to keep it repaired.

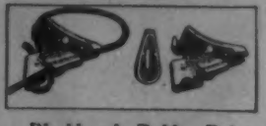
Write for price list and literature

NATIONAL TELEPHONE SUPPLY COMPANY

CLEVELAND, OHIO

There is a decided saving through the use of

Blackburn's *Boltless* Guy Clamp



Blackburn's *Boltless* Pole Clamp

Blackburn's *Boltless* Twin Guy Clamp

Blackburn's Messenger or Wire Splicer

BLACKBURN'S Boltless Guy Clamps

A saving of time, material and labor. They are easily and quickly attached, save 3 to 4 feet of guy wire and give strong, rigid service. The principal is right—the material the best and the results satisfactory.

Write for literature.

Everstick Anchor Co.

ST. LOUIS, MO.

Three Types of Top

Carbon Clip Cap

Red Seal Dry Batteries are guaranteed for all work—

On phone work they are called, by those who are using them, "the most economical phone cell made." We guarantee satisfaction and invite—urge—comparative tests.

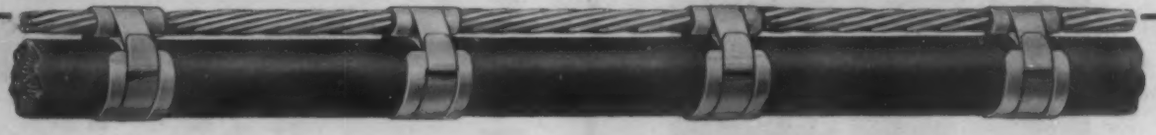
Carbon top is regular—clip or cap at no extra charge.

Guarantee

We will *credit* account, *replace* batteries or *refund* amount paid for batteries including transportation charges if they do not prove satisfactory.

Manhattan Electrical Supply Co.

New York Chicago St. Louis



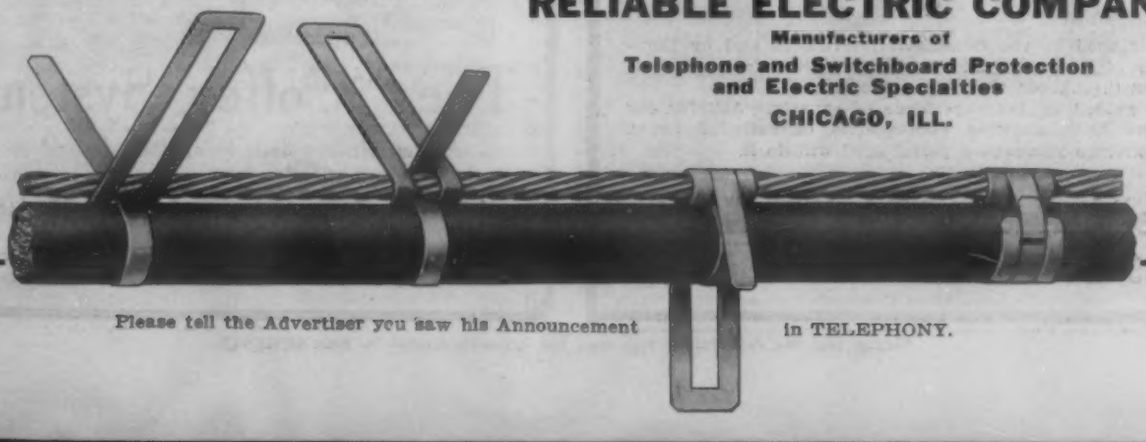
The Davidson Cable Hanger

will last. Ask the Brazos Valley Telephone and Telegraph Co., Waco, Texas, who are now equipping their entire system with the Davidson Cable Hanger. They build for permanence and the test of time has made this hanger a success over all cable hangers.

Withstand the hot sun as well as sleet and rain—won't corrode or rot. Bound to save your expensive cables by binding cable and strand into a solid mass. Easily put on—no tools necessary—once on, they stay on and outlast any hanger on the market. Made in three sizes. Write for samples and specify Davidson Cable Hangers on your next requirements.

RELIABLE ELECTRIC COMPANY

Manufacturers of
Telephone and Switchboard Protection and Electric Specialties
CHICAGO, ILL.



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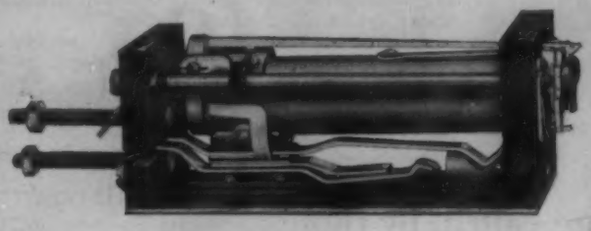
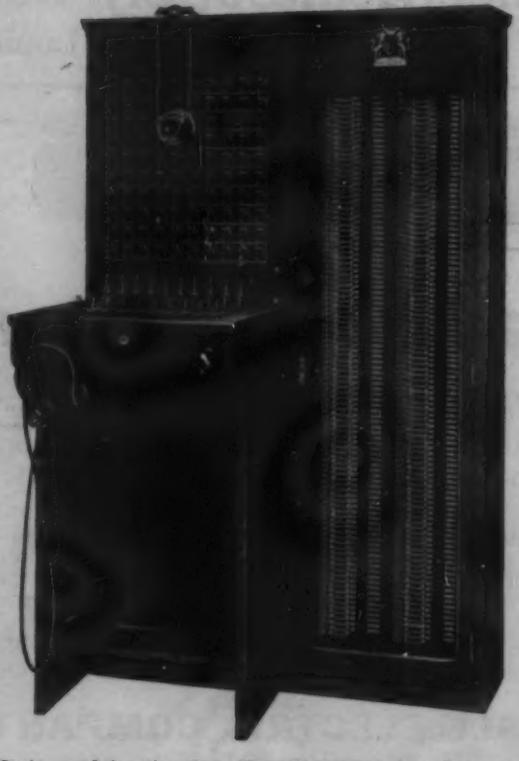
The True Reason

is clearly told in No. 31 catalogue. If you want a switchboard, you want the BEST switchboard.



There is but one SWEDISH-AMERICAN self-restoring, self-contained drop and jack. Notice the long, substantial jack sleeve which forms no part of the circuit; heavy German silver springs; removable coil from the front of the drop without loosening a screw or unsoldering a wire; positive night bell; double wound ring-off drops with condenser in each cord circuit; listening and ringing keys with contact points at the bottom, and every part constructed with a view to

Simplicity Economy Satisfaction



It is used by the Canadian Government and by thousands of Exchange and Long Distance telephone companies throughout the United States.

Be guided by the experience of experts. Ask for our picture book showing photographs of satisfied users. Convince yourself—a postal card will do it.

Swedish-American Telephone Mfg. Co.
5235 E. Ravenswood Park Chicago

Advertising Comes High

—and the best advertisement you have is Mr. Satisfied Subscriber—so hang on to him—or better get more "best ads."

We could cite you numerous cases in which the subscriber figures as an ad—he does every time he comments on your phone or your service.

Chicago subscribers—or people using *Chicago* telephones—are satisfied; they are good live ads—for us—and for you.

Write for "Making Good"—a little book written to show you how to *satisfy your subscribers*—and greatly improve *your service* at a saving—yes, it's possible; write and see.

Do you know of our Free Trouble Insurance Policy, which legally binds us to pay all trouble expense Chicago phones incur? Information on request.

CHICAGO TELEPHONE SUPPLY COMPANY
ELKHART, INDIANA

Blake Insulated Staples

Unequalled for telephone and bell wiring. The fibre insulation prevents troublesome short circuits and grounds.

5 Sizes Pat. Nov., 1900

Write for Samples

Blake Signal & Mfg. Co.
BOSTON, MASS.

What they all say,
Book-keeping
is a pleasure when you use
The "Coffey System"

A few minutes daily brings the desired results automatically at the close of the month.

The Coffey System & Audit Co.
Pythian Building
New 'Phone-363 :: :: :: Indianapolis

Legal Cases and Decisions

By A. H McMillan

Telephone Service as a Commodity of Commerce.

One telephone company brought suit against another for the specific performance of a contract for the sale of certain telephone lines and to enjoin the violation of the agreement.

The plaintiff operated several rural lines radiating from the city of Cumberland, Wisconsin. The defendant company operated similar lines and in addition furnished telephone service in that city. Prior to May, 1909, some of the rural lines of the parties were parallel and served the same territory. The plaintiff company was contemplating the installation of an exchange to furnish telephone service to Cumberland, in competition with the defendant.

To comply with the wishes of the merchants and business men of the city who desired to secure telephone connection with all the corporations of both companies by single telephones in each business place, and who were willing to secure a reduction in the cost of telephone service to them by an increased rate for the single telephone, the contract in question was executed. The increased rate, however, was to be less than the combined rates for telephones from both companies.

The contract provided that it should take effect after the state railroad commission had consented to the proposed raising of rates. Upon this consent being given, the plaintiff company was deemed to have purchased from the defendant company those rural telephone lines belonging to the defendant which were parallel to lines of the plaintiff, and was to have the option to purchase the other rural lines. The plaintiff company was to refrain from furnishing telephone service in the city to residents except as to one telephone already installed and each company for seven years was to furnish free connection to the patrons of the other. The defendant company was to erect no rural lines and was not to increase beyond 25 the number of telephones on any of the existing rural lines maintained by it.

The complaint alleged that the conditions of the contract had been complied with by the plaintiff company, but that the defendant company, contrary to the provisions of the contract, had extended its lines outside the city, had added new lines to its rural system in violation of the conditions of the contract, and had refused to comply with the option given by it to the plaintiff company for the purchase of the defendant's remaining rural lines.

In view of the public utilities law empowering the state railroad commission to prevent exorbitant charges, the contract was held not to "restrain or prevent competition" within the laws of the state, which provide that any corporation, which shall enter into any combination, conspiracy, trust, pool, agreement or contract intended to restrain and prevent competition in the supply or price of any article or commodity in general use, shall have its charter cancelled. In interpreting the law, the court classed telephone service within the general terms of the statute, as a commodity constituting a subject of commerce.

The court also held that the complainant company was entitled to enforce the specific performance of the agreement to sell the rural lines, there being no adequate remedy at law. McKinley Telephone Co. vs. Cumberland Telephone & Telegraph Co., 140 Northwestern, 38.

Is a Rural Company a Public Service Corporation?

Several farmers associated together for the purpose of establishing and constructing a rural telephone line from the village to their homes. They formed a corporation under chapter 58 of the laws of 1905 for Minnesota. The company was not incorporated for pecuniary profit but simply for the benefit of the members. The original members were required to pay $50 for their system and later an additional amount of $10 was received. The admission of new members was provided for, each being required to pay $50 for his stock. Two other persons sought to become members and offered to comply with the rules and regulations of the company.

The system was divided into a number of branches called "Line 1," "Line 2," etc. These persons demanded to be connected with "Line 1." This was refused, but the company offered to connect them with "Line 2." Claiming that they had been wrongfully refused, the persons brought suit to compel connection. The court did not decide whether the company was a public service corporation, saying that it was unnecessary to do so, because, conceding it so to be, the persons desiring membership, had not shown that they were refused either arbitrarily or unjustly.

The company showed that all the telephones which could be given service were already connected with "Line 1," and that the parties did not seek and were not refused connection with "Line 2." State vs. Hawk Creek Telephone Co., 139 Northwestern, 711.

Contract for Rates.

The rates for telephone charges were provided in an ordinance adopted and accepted in the year 1900 and agreed to by an assignee of the privileges granted by such ordinance in the year 1905, as a condition of the municipal consent to the transfer, such consent being necessary under the terms of the ordinance. The resolution and the consent to the transfer to the new company, provided that, in consideration of the payment of certain arrearages of 2 per cent of gross receipts due the city from the old company and certain additional services, the city would receipt to the manager of the company for the 2 per cent referred to from year to year, "so long as he shall remain manager and said company makes no attempt to change the present rates for service".

By the laws of the state, cities of the second class were given the control of streets and alleys and it was provided that before any one should enter upon them to construct a telephone system, the right to do so must be obtained by franchise. Under these circumstances it was held that the rates fixed in the ordinance should remain in force until action was taken by the state, or by its authorities.

The mayor and council of cities of the second class were held to have no authority to contract for rates for a term of years for telephone service to be furnished the inhabitants of the city after the state by direct legislation, or through a commission, or other lawfully delegated authority, had acted on the subject. In this particular case the telephone company was held estopped to claim that its contract with the city was beyond the powers of the municipal corporation. City of Emporia vs. Emporia Telephone Co., 129 Pacific, 187.

Plant Your Poles Deep.

If a telephone company erects a telephone pole and negligently does not set it deep enough in the ground, and by reason thereof one of its linemen, engaged in stretching wires upon it, in the exercise of ordinary care, and without knowledge or opportunity from the company to know of the improper construction, is injured by the falling of the pole, he may recover damages from the company. Thus the supreme court of Georgia declared in a recent case.

The fact that the pole was purchased or acquired by one telephone company from another does not deprive the lineman of his damages unless the defects in the poles were latent, and could not have been discovered by the purchaser in the exercise of ordinary and reasonable care. It was also held that the rule of the company requiring the lineman to inspect poles before climbing them would not necessarily debar the lineman from recovering his damages. Southern Bell Telephone & Telegraph Co. vs. Covington, 77 Southeastern, 382.

Wearing Rubber Gloves in Handling Wires.

An electric light wire splicer met his death by taking hold of an uninsulated telephone wire which had fallen across a heavily charged electric cable. For his death an action was brought, in which the judge laid down as law for the jury, that if they believed the wearing of rubber gloves and boots would have been a reasonable precaution for the splicer to have taken for his safety, and that, knowing the peril of working without them, he took hold of the wire without such precaution, the jury should find for the company.

This instruction was held proper. The verdict for the company was upheld. Jeffrey vs. Union Electric Light & Power Co., 153 Southwestern, 498.

B&K

FOR YOUR SPRING CONSTRUCTION

It Will Pay Well to Get in Touch With

B&K

Pressed Steel Line Specialties

because of their labor-saving and efficient service-giving qualities.

You save in freight on these specialties because they are of pressed steel.

The Anchor Rods can be furnished with eyes at both ends or with eye at one end, thread and nut at the other, as shown in illustration. The material used in our specialties is the very best. The designs are practical and B & K specialties

Will Save You Money

B & K Guy Clamps will hold *beyond* the breaking point of the wire with no damaging effect on the clamp.

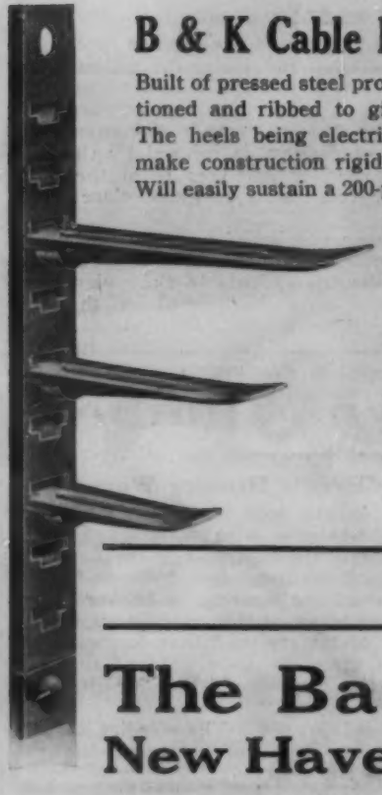
It doesn't injure the strand.

It saves the linemen's time by being quickly and easily adjusted.

It saves the road's money by saving time, material and maintenance.

B & K
Anchor Rods

B & K
Guy Clamp



B & K Cable Bracket

Built of pressed steel properly proportioned and ribbed to give strength. The heels being electrically welded make construction rigid and strong. Will easily sustain a 200-pound weight at extreme end of 10-in. bracket.

By using pressed steel the production cost is cut—you getting the benefit.

B & K Mushroom Guy Anchor

Built of sectional members and of light weight indestructible steel. Much more cheaply and safely transported than creosoted blocks, and take up less room.

By fitting parts together you can increase the area as required until the entire disc is formed, at the same time increasing the thickness of the hub. Cheaper than "dead men" in the long run — and much cheaper in freight charges.

Write for the B & K Catalogue

The Barnes & Kobert Mfg. Co.

New Haven :: :: :: Connecticut

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A New Type of Portable D'Arsonval Galvanometer

Sensitivity—1 megohm. **Resistance**—about 225 ohms. **Period**—about 2.5 seconds.

A suspended D'Arsonval galvanometer—so rugged that it will withstand more rough usage than an ordinary voltmeter.

The moving system is contained in a separate unit which is easily removable. Should the system become damaged due to excessive jars, this unit may be removed and returned to us by mail; weight, 4 ounces. Repairs will be made within one day of receipt.

Bulletin No. 232 describes this instrument. Ask for a copy

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4904 Stenton Avenue, Philadelphia

McMeen and Miller
(Incorporated)

Samuel G. McMeen Kempster B. Miller Leigh S. Keith

Electrical and Mechanical Engineers

1454 Monadnock Block :: :: CHICAGO

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AFFILIATED WITH THE
WIRE INSPECTION BUREAU

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Prices on Request Correspondence Solicited

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Will you allow us to estimate?

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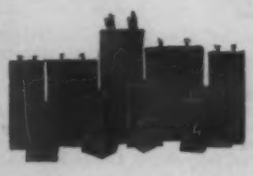

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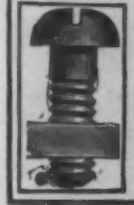
TYPE, TELEPHONE
CONDENSERS

embody all the essentials of long life and good service. *Write for Literature*

ELECTRIC SPECIALTY CO.
Cresco, Iowa



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CEDAR POLES

Prompt Shipments
Write for Prices
TORREY CEDAR CO., Clintonville, Wis.

J-M TELEPHONE MATERIALS

J-M Fibre Conduit. "Noark" Fuses and Fuse Devices, Jomanco Friction Tape
J-M Phoenix Splicing Compound, J-M Guy Anchors, J-M Asbestos Roofing,
J-M Transite Ebony Asbestos Wood.

H. W. JOHNS-MANVILLE CO. New York and every large city

Vulcanized Fibre Special Shapes

Machined to Exact Gauge
Vulcanized Fibre in Sheets, Rods and Tubes
BAKELITE-DILECTO—High Efficiency, Water Resisting FIBRE
THE CONTINENTAL FIBRE COMPANY
CHICAGO, McCormick Bldg. NEWARK, DEL. NEW YORK, Woolworth Bldg.

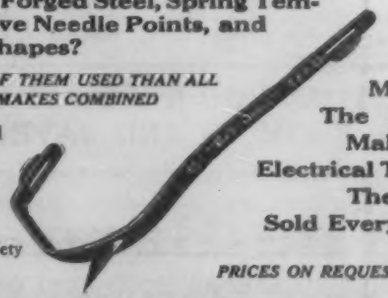
DO YOU KNOW THAT

"Red Devil" Climbers

Are Drop Forged Steel, Spring Tempered, Have Needle Points, and Correct Shapes?

MORE OF THEM USED THAN ALL OTHER MAKES COMBINED

Specified by all the leading companies—demanded by the alert lineman for safety and comfort.



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Classified Advertisements in "TELEPHONY" cost 5 cents per word—minimum number of words per insertion, twenty. Cash should accompany order. Advertisements in black face type, 10 cents per word. No advertisements accepted after Thursday.

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SWITCHBOARDS —Telephones—Apparatus — Protection Equipment—Cable—Everything you need for the installation and operation of a complete exchange—Magneto or Central Energy—of the best and most reputable manufacturers.

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Address

"Rebuilt" Equipment Department

PREMIER ELECTRIC COMPANY

CHICAGO, ILL.

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UNUSED TELEPHONES FOR SALE CHEAP—All parts are guaranteed—if not satisfied return to us. Prices and literature on request. Interstate Elec. & Mfg. Co., Sioux City, Iowa.

BUY A SECOND-HAND TELEPHONE all in working condition for $1 to $1.50 each, and have it on hand for repairs; three bar generator; Sterling or Standard transmitter; ear trumpet; crank; binding posts; gongs and standards. Only a few hundred left. Address Telephone Sales Co., Oxford, Wis.

FOR SALE—Telephones bridging, three to four dollars each; telephones, series, one to three dollars each; Sterling terminals with cable attached 100 line go at $15 each. Everything sent out guaranteed. Phones without batteries one dollar, switchboard cable, generators, induction coils—everything telephony. Address: Telephone Sales Co., Oxford, Wis.

Cable Testers

WET CABLE TROUBLE—If the wet spot can be located without cutting the cable the Wireless Cable Tester will do it. Sent on trial. Address, Electric Spec. Mfg. Co., 426 Granby St., Cedar Rapids, Iowa.

Cross Arms

CROSS ARMS manufactured from sound, straight grain Douglas fir. Send us specifications and get our prices before buying. Cameron Lumber Co., Ltd., Victoria, B. C. Can.

Directory Hangers

WE BEG TO DIRECT YOUR ATTENTION to the Universal Wire Loop, an improvement upon the ordinary string loop for hanging up catalogues, directories, telephone books, prices current, etc. Write us for prices and samples. Wire Loop Mfg. Co., 75 Shelby St., Detroit, Mich.

Expert

I AM A PATENT EXPERT. Consulting Engineer and Specialist in Electrical and Telephone Engineering. What is your problem? Francis W. Dunbar, Monadnock Block, Chicago, Ill.

Help Wanted

WANTED—Will take partner in telephone business either salary or profit sharing basis to suit any one interested, to join in building new lines. No competition. And to operate existing lines in connection I have best toll line proposition. I know of about ten towns needing exchanges. Some money necessary. Address: Lake Shore Telephone Co., Grand Marais, Minn.

WANTED—At once, chief operator for medium sized common battery plant in Texas. Write full information and state salary wanted. Address 1472, care TELEPHONY.

WANTED—Two telephone linemen; steady work; $40 to $60. Salary according to ability. Address Coon Bros., Rantoul, Ill.

Loose Leaf Binders

FOR SALE—Loose Leaf Binders for telephone records as supplied to New York Telephone Company. Tell us your requirements. Buchan Sales Co., 314-320 Market St., Newark, N. J.

Plants For Sale or Exchange

FOR SALE—Telephone exchange, 190 telephones; 1,800 feet cable; county-seat and growing town. Address A. C. Ferris, Syracuse, Kans.

NEXT TIME YOU NEED APPARATUS ORDER FROM US AND SAVE MONEY

All apparatus listed in our bulletin is practically new—no obsolete apparatus

BULLETIN NO. 5 SENT ON REQUEST

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FRANKEL TESTING CLIPS

No. 2521

The Standard Patented U. S. Nov. 15, 1904 and Foreign Countries.

The teeth grip the wire or binding post, the pin pierces the insulation of wire, making a perfect test connection.

Order today.

PRICES

Less than 12, 20c
Doz. lots 12½c
100 lots 11c
500 lots 10c
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FRANKEL DISPLAY FIXTURE CO.

733-735 Broadway, New York

FOR SALE OR EXCHANGE—On account of health, plant of over 1,000 subscribers; can be doubled. Income $4,000, above expenses. No debts. Address Illinois, care TELEPHONY.

FOR SALE—Telephone plant for $1,500, except $300 interest held locally. 60 telephones, 7 miles rural line; new construction; good cedar poles, shaved and painted. 600 population in growing county seat; undeveloped territory; 25 year franchise. Rates, $1.50; residence, $2.50; business country, $2 to $4 per month. Good chance for toll line. You can't get the merits of the business by writing, if you want it, come and see. It's worth three times what I ask. Address: Lake Shore Telephone Co., Grand Marais, Minn.

FOR SALE—Am in position to give half interest in an exchange in a Southern city of 10,000 inhabitants to the right party who will put $15,000 into the plant for development purposes. Original cost of plant was $40,000. Development opportunities justify this sacrifice. Address 1464, care TELEPHONY.

Poles

WHITE CEDAR POLES: Produced from our lands. All sizes. Prompt shipments. May we have your next order? Write for quotations. Kaye & Carter Lumber Co., 727 Lumber Exchange Bldg., Minneapolis, Minn.

WE HAVE A LARGE STOCK of Western Red Cedar Poles, Northern White Cedar Poles, Butt Treated Poles. Get our prices. Page & Hill Co., Minneapolis, Minn.

Pole Changers

AN EFFICIENT POLE CHANGER makes good under all conditions—only $15 complete—why pay more? Order on 30 days' free trial or write, Current Electric Co., 18 E. Kinzie St., Chicago.

Positions Wanted

WANTED—A practical, competent telephone man, 15 years' experience in every branch of business, now holding responsible position with one of the largest concerns, wants to get back into the operating field; will invest $1,500 in a good exchange where services as manager will pay at least $100 a month. Thoroughly competent in every department and the man you are looking for to get results. Must be a good company and in a good town. The very best of references. Write giving full particulars. Address: 1452, care TELEPHONY.

WANTED—Position as manager or troubleman and manager by married man; eight years' experience. State of Wisconsin preferred. Address 1469, care TELEPHONY.

WANTED—Position by sober, reliable cable splicer, experienced in galvanometer and exploring coil work, also construction. Age 28. Married. Will consider only permanent position paying at least $100. Address 1470, care TELEPHONY.

WANTED—Position as manager. Ten years' experience covering all departments of Bell and Independent (Automatic) companies. Total abstainer. Age 30. Married. Employed but desires larger exchange. Address 1471, care TELEPHONY.

WANTED—First-class up-to-date telephone man, with 20 years of experience in constructing, maintaining and operating exchanges, desires position as manager or superintendent; would prefer a position where results would be appreciated. Address 1463, care TELEPHONY.

Protective Apparatus

PROTECT YOUR CABLE the better way—install Moon Terminals, compact, accessible, easily and quickly installed. You owe it to your service. Write for information. Moon Mfg. Co., 120 N. Jefferson St., Chicago.

Telephone Pay Station Signs

TELEPHONE PAY STATION SIGNS—Finest porcelain enamel. Practically indestructible. Retain true colors and finish. Get the ones with the reputation. Burdick Enamel Sign Co., 166 N. State St., Chicago, Ill.

Telephone Supplies

TELEPHONE SUPPLIES—Large and complete stock, prompt shipments and best discounts. Send for our catalogue Harry I. Wood Co., 514 W. Main St., Louisville, Ky.

WE ARE JOBBERS of electrical supplies. Our service and prices are unexcelled. Let us send you our catalog. Robinson-Nelson & Co., 711 E. Main St., Richmond, Va.

CONSTRUCTION SUPPLIES—Anything you need for your construction work can be ordered from us at prices that can't be beat. Doubleday-Hill Elec. Co., 721 Liberty Ave. Pittsburgh, Pa.

WE ARE JOBBERS. Get our prices on telephones, wires, pins, brackets, poles, cross arms, glass insulators—pole line hardware. Indianapolis Elec. Supply Co., Indianapolis, Ind.

A PRINTOGRAPH FOR SALE; $75 takes it, with motor and type, complete. For circular letters, bills and office printing. Fine condition. Worth $250. TELEPHONY PUBLISHING CO.

"Buyers" Reference Index

The letter with accompanying number indicates the name of advertiser as given in full in the Alphabetical Index to Advertisers, adjoining. *When making known your wants* to any listed herein, please mention TELEPHONY.

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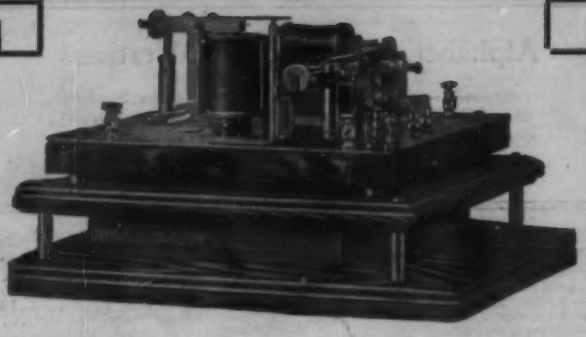

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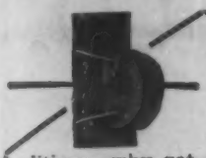

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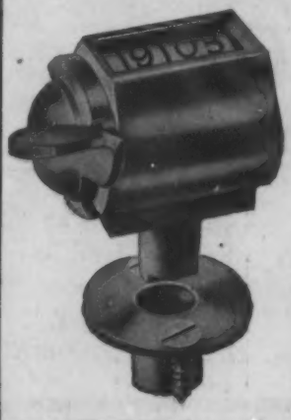

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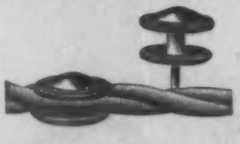

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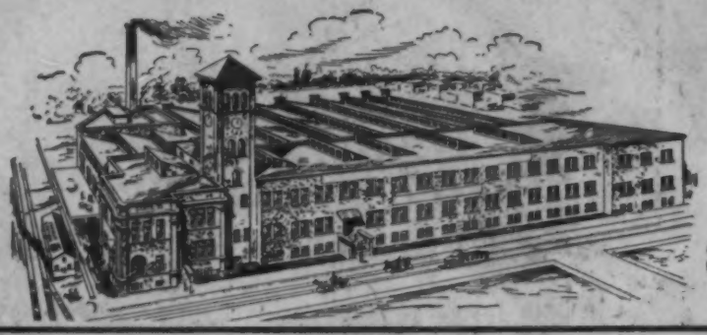

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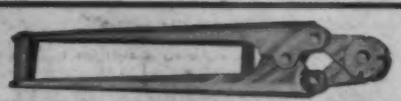

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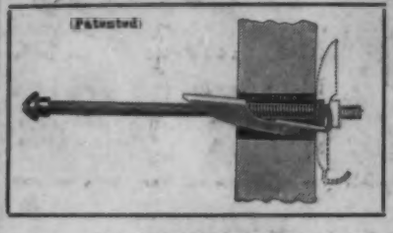

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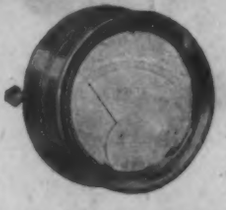

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